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| 10/770,726 | 02/04/2004 | Eugene Brown | WYE-032 | 6144 |

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| EXAMINER | |
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| DUFFY, BRADLEY | |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/770,726 | BROWN ET AL. | |
| | Examiner | Art Unit | |
| | Brad Duffy | 1643 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *21 May 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1,5-7 and 26-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,5-7 and 26-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☒ Other: *Exhibit, A, B, C and D*.

## DETAILED ACTION

1. The amendment filed May 21, 2007, is acknowledged and has been entered. Claims 21-25 have been cancelled. Claims 1, 5-7 have been amended. Claims 26-30 have been newly added.

2. Claims 1, 5-7 and 26-30 are pending in the application and are under examination.

3. The following Office action contains NEW GROUNDS of rejection necessitated by amendment.

### *Priority*

4. Applicant's claim under 35 USC §§ 119 and/or 120 for benefit of the earlier filing date of the 60/444,637, filed February 4, 2003, is acknowledged.

However, claims 1, 5-7 and 26-29 do not properly benefit under 35 U.S.C. §§ 119 and/or 120 by the earlier filing dates of the priority documents claimed, since those claims are rejected under 35 U.S.C. § 112, first paragraph, as lacking a sufficiently enabling disclosure.

To receive benefit of the earlier filing date under 35 USC §§ 119 and/or 120, the later-filed application must be an application for a patent for an invention which is also disclosed in the prior application (the parent or original nonprovisional application or provisional application); the disclosure of the invention in the parent application and in the later-filed application must be sufficient to comply with the requirements of the first paragraph of 35 U.S.C. 112. See *Transco Products, Inc. v. Performance Contracting, Inc.*, 38 F.3d 551, 32 USPQ2d 1077 (Fed. Cir. 1994).

Accordingly, the effective filing date of claims 1, 5-7 and 26-29[1] is deemed the filing date of the instant application, namely February 4, 2004.

### *Grounds of Objection and Rejection Withdrawn*

5. Unless specifically reiterated below, Applicant's amendment and/or arguments filed May 21, 2007, have obviated or rendered moot the grounds of objection and rejection set forth in the previous Office action mailed February 20, 2007.

### *Grounds of Objection Maintained*

6. The objection to the specification because the use of improperly demarcated trademarks is maintained. Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner that might adversely affect their validity as trademarks. See MPEP § 608.01(v).

Although it appears that Applicant has made a *bona fide* attempt to resolve this issue by appropriately amending the specification, an additional example of an improperly demarcated trademark appearing in the specification is noted, namely Taxol™; see, e.g., paragraph [0101] of the published application.

Again, appropriate correction is required. Each letter of a trademark should be capitalized or otherwise the trademark should be demarcated with the appropriate symbol indicating its proprietary nature (e.g., ™, ®), and accompanied by generic terminology. Applicants may identify trademarks using the "Trademark" search engine under "USPTO Search Collections" on the Internet at http://www.uspto.gov/web/menu/search.html.

### *Grounds of Rejection Maintained*

[1] Note: Claim 30 is indefinite, as noted below, and cannot be examined for compliance with the requirements set forth under 35 U.S.C. §§ 112, first paragraph, 102, and 103.

***Claim Rejections - 35 USC § 112***

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. The rejection of claims 1, 5-7 and 26-29 under 35 U.S.C. 112, first paragraph, because the specification, **while being enabling for using** a method of detecting colon adenocarcinoma markers comprising detecting an expression profile of at least one nucleic acid in a colon cancer tissue from a human subject, wherein said at least one nucleic acid is selected from the group of SEQ ID NO:26, SEQ ID NO:1, and SEQ ID NO: 12, wherein said at least one nucleic acid is overexpressed compared to a normal colon tissue reference control, **and while being enabling for using** a method of detecting lung adenocarcinoma markers comprising detecting an expression profile of at least one nucleic acid in a lung cancer tissue from a human subject, wherein said at least one nucleic acid is selected from the group of SEQ ID NO:26, SEQ ID NO:1, and SEQ ID NO: 12, wherein said at least one nucleic acid is overexpressed compared to a normal lung tissue reference control, **and while being enabling for using** any process encompassed by the claims, which has been described by the prior art, **does not reasonably provide enablement for using** the claimed processes, is maintained. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims.

At page 8 of the amendment filed May 21, 2007, Applicant has traversed this ground of rejection.

Applicant's arguments traversing the ground of rejection set forth in the preceding Office action have been carefully considered but not found persuasive to obviate this rejection.

M.P.E.P. § 2164.01 states:

> The standard for determining whether the specification meets the enablement requirement was cast in the Supreme Court decision of *Mineral Separation v. Hyde*, 242 U.S. 261, 270 (1916) which

> postured the question: is the experimentation needed to practice the invention undue or unreasonable? That standard is still the one to be applied. *In re Wands*, 858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988). Accordingly, even though the statute does not use the term "undue experimentation," it has been interpreted to require that the claimed invention be enabled so that any person skilled in the art can make and use the invention without undue experimentation. *In re Wands*, 858 F.2d at 737, 8 USPQ2d at 1404 (Fed. Cir. 1988).

There are many factors to be considered when determining whether there is sufficient evidence to support a determination that a disclosure does not satisfy the enablement requirement and whether any necessary experimentation is "undue". These factors, which have been outlined in the Federal Circuit decision of *In re Wands*, 858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988), include, but are not limited to, the nature of the invention, the state of the prior art, the relative skill of those in the art, the amount of direction or guidance disclosed in the specification, the presence or absence of working examples, the predictability or unpredictability of the art, the breadth of the claims, and the quantity of experimentation which would be required in order to practice the invention as claimed. See also *Ex parte Forman*, 230 USPQ 546 (BPAI 1986).

The amount of guidance, direction, and exemplification disclosed in the specification, as filed, would not be sufficient to enable the skilled artisan to use the claimed invention at the time the application was filed without undue and/or unreasonable experimentation.

The present claims are directed to methods of detecting an expression profile of at least one nucleic acid in a colon or lung cancer tissue from a human subject, wherein said at least one nucleic acid comprises a sequence is selected from the group consisting of SEQ ID NO: 1, SEQ ID NO:12, and SEQ ID NO:26; comparing said expression profile to a normal tissue reference expression profile of said at least one nucleic acid; and determining whether the nucleic acid is overexpressed compared to the normal tissue reference expression profile, thereby to detect a marker of the colon or lung cancer.

Notably, while Applicant's response at page 8 filed May 21, 2007, does provide evidence that the specification also teaches the overexpression of each of the mRNAs comprising the sequence of SEQ ID NO: 1, SEQ ID NO:12, and SEQ ID NO:26 in lung

cancer tissue, as compared to a normal lung tissue reference expression profile, as well as the overexpression of each of the mRNAs comprising the sequence of SEQ ID NO: 1, SEQ ID NO:12, and SEQ ID NO:26 in colon cancer tissue, as compared to a colon tissue reference expression profile (see page 8, 2nd paragraph of the response filed May 21, 2007 and Table 6A of the specification), it is noted that the claims are not limited to comparing the claimed cancer tissue expression profile to a corresponding normal lung or colon tissue profile, respectively; accordingly, the claims are directed to comparing the colon or lung cancer expression profile to any normal tissue reference profile and one of skill in the art would be subject to undue experimentation to use methods of detecting a colon or lung cancer marker, wherein the expression profile of the mRNAs comprising the sequence of SEQ ID NO: 1, SEQ ID NO:12, and SEQ ID NO:26 in a colon cancer tissue or a lung cancer tissue are not compared to a corresponding normal colon tissue reference profile or a corresponding normal lung tissue reference profile, respectively.

Notably, the specification discloses the following about the cancer markers of the invention:

> The present invention pertains to the use of the CPKGs listed in Table 1, the transcribed polynucleotides (CPKPN), and the encoded polypeptides (CPKPP) as markers for cancer. Moreover, the use of expression profiles of these genes can indicate the presence of a risk of cancer. (see page 31).
>
> The present invention provides compositions and methods for the diagnosis, prevention, or treatment of numerous cancers. The present invention also provides methods for the identification of novel therapeutic agents for treating cancers. In addition, the present invention provides animal models useful for studying the pathogenesis of cancers. The present invention is based on the discovery of cancer genes that are overexpressed in at least two types of cancer tissues as compared to corresponding cancer-free tissues. In many embodiments, the cancer genes are overexpressed in colon cancer, lung cancer, breast cancer, or prostate cancer tissues, as compared to the corresponding cancer-free tissues. (see page 9).

Thus, for example, while the specification enables the skilled artisan to use processes to detect overexpressed mRNAs comprising the sequence of SEQ ID NO: 1, SEQ ID NO:12, and SEQ ID NO:26 as colon cancer markers by comparing a colon cancer expression profile of the mRNAs comprising the sequence of SEQ ID NO: 1, SEQ ID NO:12, and SEQ ID NO:26 with a expression profile of said mRNAs in a corresponding cancer-free colon tissue, it does not reasonably enable the use of the claimed processes to detect colon or lung cancer markers in which the comparison made is to any "normal tissue reference expression profile", but not necessarily those of normal (i.e., non-cancerous) colon and lung tissues, respectively, because the specification does not teach other normal tissue expression reference profiles that could be used to detect the claimed mRNAs as a "marker" of colon cancer. Furthermore, it is submitted that the skilled artisan cannot predict whether any such comparison to a "normal tissue reference expression profile", where the tissue is not colon or lung tissue, will identify a marker of colon or lung cancer, but in most cases it is expected that it would not.

Thus, contrary to Applicant's argument, the amendment to claim 1 has not obviated the ground of rejection set forth in the preceding Office action because the amendment does not require that the expression profile of the colon cancer tissue be compared to a normal colon tissue reference expression profile as set forth in the preceding Office action. Similarly, while Applicant has provided evidence that the specification would enable detecting the expression profile of mRNAs comprising the sequence of SEQ ID NO: 1, SEQ ID NO:12, and SEQ ID NO:26 in a lung cancer tissue and comparing said expression profile to a normal lung tissue reference expression profile to detect lung cancer markers as the mRNAs comprising the sequence of SEQ ID NO: 1, SEQ ID NO:12, and SEQ ID NO:26 are also overexpressed in lung cancer, the amendment to claim 1 has not enabled using these lung cancer markers as the lung cancer tissue expression profile can be compared to any normal tissue expression profile and one of skill in the art would be subject to undue experimentation to use such methods.

In conclusion, upon careful consideration of the factors used to determine

whether undue experimentation is required, in accordance with the Federal Circuit decision of *In re Wands*, 858 F.2d at 737, 8 USPQ2d at 1404 (Fed. Cir. 1988), the amount of guidance, direction, and exemplification disclosed in the specification, as filed, is not deemed sufficient to have enable the skilled artisan to use the claimed invention at the time the application was filed without undue and/or unreasonable experimentation.

***New Grounds of Objection***

9. Claim 7 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

In this case, the method of claim 1 is practiced by detecting an expression profile of at least one nucleic acid in a colon cancer tissue, as opposed to a lung cancer tissue, from a human subject having lung cancer in accordance with claim 7, it is unclear how, or whether the limitation recited in claim 7 further limits the subject matter of claim 1.

Must the subject have both colon and lung cancers?

10. Claim 26 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

In this case, the method of claim 1 is practiced by detecting an expression profile of at least one nucleic acid in a colon cancer tissue, as opposed to a lung cancer tissue, from a human subject having lung cancer in accordance with claim 26, it is unclear how, or whether the limitation recited in claim 26 further limits the subject matter of claim 1.

Must the subject have both colon and lung cancers?

***New Grounds of Rejection***

### *Claim Rejections - 35 USC § 112*

11. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

12. Claim 30 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 30 is indefinite in the recitation of "wherein the sequence is SEQ ID NO:31". This limitation lacks antecedent basis, as claim 1 only refers to "a sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO12 and SEQ ID NO:26".

Accordingly, the claim fails to delineate the subject matter that Applicant regards as the invention with the requisite degree of clarity and particularity to permit the skilled artisan to know or determine infringing and non-infringing subject matter and thereby satisfy the requirement set forth under 35 U.S.C. § 112, second paragraph.

### *Claim Rejections - 35 USC § 102*

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

14. Claims 1, 7, 26 and 29 are rejected under 35 U.S.C. 102(a) as being anticipated by WO 03/025138 A2 (Afar et al, published March 2003).

The claims are herein drawn to methods comprising detecting an expression profile of a nucleic acid comprising SEQ ID NO:26 in a colon cancer tissue from a human subject and comparing said expression profile to the expression profile of a nucleic acid comprising SEQ ID NO:26 from normal colon tissue to determine whether

said nucleic acid is overexpressed in the cancer tissue or to methods comprising detecting an expression profile of a nucleic acid comprising SEQ ID NO:26 in a lung cancer tissue from a human subject and comparing said expression profile to the expression profile of a nucleic acid comprising SEQ ID NO:26 from normal lung tissue to determine whether said nucleic acid is overexpressed in the cancer tissue.

Afar et al teach methods of detecting an expression profile of an mRNA comprising a nucleotide sequence that is 100% identical to the instantly claimed SEQ ID NO:26 in colon cancer tissues[2], and comparing said expression profile to the expression profile of an mRNA from corresponding normal colon tissue to determine whether said nucleic acid is overexpressed in the cancer tissue. Afar et al also teach methods of detecting an expression profile of an mRNA comprising a nucleotide sequence that is 100% identical to the instantly claimed SEQ ID NO:26 in lung cancer tissues, and comparing said expression profile to the expression profile of an mRNA from corresponding normal lung tissue to determine whether said nucleic acid is overexpressed in the cancer tissue; see entire document (e.g., SEQ ID NO:27; page 6, lines 4-27; page 23, line 13 through page 25, line 24; page 37, line 26 through page 38, line 12; and page 52, line 16 through page 53, line 32).

Thus, Afar et al anticipate these claims.

### *Claim Rejections - 35 USC § 103*

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

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[2] See the alignment of these sequences attached here as Exhibit A.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

16. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

17. Claims 1, 5, and 6 are rejected under 35 U.S.C. 103(a) as being anticipated by WO 03/025138 A2 (Afar et al, published 2003).

Claims 1, 5, and 6 are directed to the method of claim 1, wherein the normal tissue reference profile is an average expression profile of said at least one nucleic acid in a plurality of reference biological samples of cancer-free subjects and wherein said expression profiles are determined using RT-PCR or nucleic acid arrays.

Additionally, Afar et al teach said expression profiles being determined using RT-PCR or nucleic acid arrays (e.g., page 53, line 6-13).

With regard to claims 5 and 6, it is noted that Afar et al do not expressly teach that the normal tissue reference profile is an "average" expression profile of said nucleic acid from cancer-free subjects. Nevertheless, it would have been *prima facie* obvious to one ordinarily skilled in the art at the time the invention was made to measure the

expression profile of said at least one nucleic acid in more than one reference biological sample, and then determine the average value of the expression profiles of that nucleic acid in the samples, so as to compare the expression profile of the nucleic acid in the colon cancer tissue and the average value in cancer-free colon tissue or to compare the expression profile of the nucleic acid in the lung cancer tissue and the average value in cancer-free lung tissue, because it would be recognized that the average value better reflects the standard level of expression in normal, non-cancerous colon or lung tissues. This is because it would be expected that the normal level of expression of any nucleic acid will vary in normal subjects, at least to some extent, such that the difference in the levels of expression in the colon or lung cancer tissue and any one specimen of the corresponding normal tissue might be more or less significant, which could lead the practitioner of the process to falsely conclude that the nucleic acid is or is not overexpressed in the cancerous tissue. Therefore, one ordinarily skilled in the art at the time the invention was made to would have been motivated to do so in order to more accurately determine whether or not the nucleic acid is overexpressed in the colon or lung cancer tissue, relative to the standard level of expression that occurs in the corresponding normal tissues.

Because Afar et al. teaches the expression profiles are determined using RT-PCR or nucleic acid array, it would have been *prima facie* obvious to determine the average value of the expression profiles of that nucleic acid in the samples using such methodology. One ordinarily skilled in the art would have been motivated to do so because such methodology was both routine and conventional at the time the invention was made, and was recognized to be very sensitive.

18. Claims 1, 5-7, 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6,632,936 (Carr, published 2003), in view of US Patent 7,101,985 (Elledge et al, published 2006) and US Patent 6,709,832 (Von Knebel Doebertiz et al, published 2004).

The claims are herein drawn to methods comprising detecting an expression profile of a nucleic acid comprising SEQ ID NO:1 in a colon cancer tissue from a human

subject and comparing said expression profile to the expression profile of a nucleic acid comprising SEQ ID NO:1 from normal colon tissue to determine whether said nucleic acid is overexpressed in the cancer tissue or to methods comprising detecting an expression profile of a nucleic acid comprising SEQ ID NO:1 in a lung cancer tissue from a human subject and comparing said expression profile to the expression profile of a nucleic acid comprising SEQ ID NO:1 from normal lung tissue to determine whether said nucleic acid is overexpressed in the cancer tissue. Claims 5 and 6 are further drawn to the method of claim 1, wherein the normal tissue reference profile is an average expression profile of said at least one nucleic acid in a plurality of reference biological samples of cancer-free subjects and wherein said expression profiles are determined using RT-PCR or nucleic acid arrays.

Carr teaches methods of detecting an expression profile of an mRNA that encodes a cell-cycle checkpoint polypeptide comprising SEQ ID NO:1 from lung cancer tissues that is 99.7% identical[3] to the instantly claimed SEQ ID NO:1. Carr also teaches methods of detecting an expression profile of an mRNA that encodes a cell-cycle checkpoint polypeptide comprising SEQ ID NO:1 from colon cancer tissues that is 99.7% identical to the instantly claimed SEQ ID NO:1; see entire document (e.g., column 5, lines 11-33). Carr also teaches said expression profiles being determined using RT-PCR or nucleic acid arrays (e.g., column 5, lines 17-25).

Carr does not expressly teach an mRNA that is 100% identical to the instantly claimed nucleic acid comprising the sequence set forth as SEQ ID NO: 1, nor does Carr expressly teach comparing the expression profile of the mRNA from the colon or lung cancer tissue to the expression profile of the mRNA from corresponding normal colon or lung tissue, respectively, to determine whether said nucleic acid is overexpressed in the cancer tissue.

These deficiencies are made up for in the teachings of Elledge et al and Von Knebel Doebertiz et al.

Elledge et al teach an mRNA comprising a nucleotide sequence (i.e., SEQ ID

[3] See the alignment of these sequences attached here as Exhibit B.

NO: 38), which encodes the **same** cell-cycle polypeptide as the polypeptide referred to by Carr, which is encoded by the disclosed nucleic acid molecule comprising SEQ ID NO: 1. Moreover, the nucleotide sequence of SEQ IID NO: 38, which is disclosed by Elledge et al., is 100% identical[4] to SEQ ID NO: 1; see entire document (e.g., column 53, line 61 to column 54, line 16).

Von Knebel Doebertiz et al teach that it is an obvious thing to compare an mRNA expression profile from a cancerous body sample with a corresponding mRNA expression profile from a body sample which originates from a healthy person) (see entire document, e.g., column 2 lines 45-48 and 59-60).

Therefore, because it would be recognized that both the nucleic acid molecules disclosed by the prior art (i.e., the nucleic acid disclosed by Carr and the nucleic acid disclosed by Elledge et al.) encode the same protein, it would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to practice the process disclosed by Carr by detecting the expression profile of the nucleic acid disclosed by Elledge et al in both lung cancer tissue and colon cancer tissue. Furthermore, because Von Knebel Doebertiz et al teach that it is an obvious thing to compare an mRNA expression profile from a cancerous body sample with a corresponding mRNA expression profile from a body sample which originates from a healthy person, it would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to compare said colon cancer expression profile to the expression profile of the same nucleic acid in normal colon tissue or to compare said lung cancer expression profile to the expression profile of the same nucleic acid in normal lung tissue, to determine whether the nucleic acid encoding the protein is overexpressed in the cancer tissue.

One of ordinary skill in the art would have been motivated to and had a reasonable expectation of success at the time the invention was made to detect expression profiles of the mRNA comprising SEQ ID NO:38 of Elledge as it encodes the same cell-cycle checkpoint polypeptide of Carr. Notably, the polynucleotide sequence

[4] See the alignment of these sequences attached here as Exhibit C.

of SEQ ID NO:38 of Elledge adds an additional 26 nucleotides to the 5' untranslated region of the mRNA taught by Carr and therefore, one of skill in the art would have been motivated to detect the mRNA of Elledge as one of ordinary skill in the art would have recognized it to be a more complete mRNA than the mRNA of Carr. Furthermore, one of ordinary skill in the art would have been motivated to compare the expression profile of the mRNA comprising SEQ ID NO:38 from the colon cancer tissue to its expression profile in corresponding normal colon tissue or to compare the expression profile of the mRNA comprising SEQ ID NO:38 from the lung cancer tissue to its expression profile in corresponding normal lung tissue as Von Knebel Doebertiz et al teach that it is obvious to compare a tissue suspected of being cancerous with a corresponding normal tissue, in order to detect cancer markers overexpressed in the cancerous tissue.

Additionally, as Elledge et al teach an mRNA with the same nucleotide sequence as the instantly claimed nucleic acid sequence there is a reasonable expectation of success in detecting and comparing expression profiles of said polynucleotide by the methods of Carr and Von Knebel Doebertiz.

With regard to claims 5 and 6, it is noted that Von Knebel Doebertiz et al do not expressly teach that the normal tissue expression profile is an "average" expression profile of said nucleic acid from cancer-free subjects. Nevertheless, it would have been *prima facie* obvious to one ordinarily skilled in the art at the time the invention was made to measure the expression profile of said at least one nucleic acid in more than one reference biological sample, and then determine the average value of the expression profiles of that nucleic acid in the samples, so as to compare the expression profile of the nucleic acid in the colon cancer tissue and the average value in cancer-free colon tissue or to compare the expression profile of the nucleic acid in the lung cancer tissue and the average value in cancer-free lung tissue, because it would be recognized that the average value better reflects the standard level of expression in normal, non-cancerous colon or lung tissues. This is because it would be expected that the normal level of expression of any nucleic acid will vary in normal subjects, at least to some extent, such that the difference in the levels of expression in the colon or lung cancer tissue and any one specimen of the corresponding normal tissue might be more or less

significant, which could lead the practitioner of the process to falsely conclude that the nucleic acid is or is not overexpressed in the cancerous tissue. Therefore, one ordinarily skilled in the art at the time the invention was made to would have been motivated to do so in order to more accurately determine whether or not the nucleic acid is overexpressed in the colon or lung cancer tissue, relative to the standard level of expression that occurs in the corresponding normal tissues.

Because Carr teaches the expression profiles are determined using RT-PCR or nucleic acid array, it would have been *prima facie* obvious to determine the average value of the expression profiles of that nucleic acid in the samples using such methodology. One ordinarily skilled in the art would have been motivated to do so because such methodology was both routine and conventional at the time the invention was made, and was recognized to be very sensitive.

Thus, there would be an advantage and a reasonable expectation of success in detecting an expression profile of a nucleic acid comprising SEQ ID NO:1 in a colon cancer tissue from a human subject and comparing said expression profile to an average expression profile of a nucleic acid comprising SEQ ID NO:1 from colon tissue obtained from cancer-free subjects or in detecting an expression profile of a nucleic acid comprising SEQ ID NO:1 in a lung cancer tissue from a human subject and comparing said expression profile to an average expression profile of a nucleic acid comprising SEQ ID NO:1 from lung tissue obtained from cancer-free subjects using RT-PCR or nucleic acid array, to determine whether said nucleic acid is overexpressed in the cancer tissue, respectively, in view of US Patent and US Patent 6,632,936, US Patent 7,101,985 and US Patent 6,709,832.

19. Claims 1, 5-7, 26 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 7,081,340 (Baker et al, published 2006), in view of US Patent 6,709,832 (Von Knebel Doebertiz et al, published 2004).

The claims are herein drawn to methods comprising detecting an expression profile of a nucleic acid comprising SEQ ID NO:12 in a colon cancer tissue from a human subject and comparing said expression profile to the expression profile of a nucleic acid comprising SEQ ID NO:12 from normal colon tissue to determine whether said nucleic acid is overexpressed in the cancer tissue or to methods comprising detecting an expression profile of a nucleic acid comprising SEQ ID NO:12 in a lung cancer tissue from a human subject and comparing said expression profile to the expression profile of a nucleic acid comprising SEQ ID NO:12 from normal lung tissue to determine whether said nucleic acid is overexpressed in the cancer tissue. Claims 5 and 6 are further drawn to the method of claim 1, wherein the normal tissue reference profile is an average expression profile of said at least one nucleic acid in a plurality of reference biological samples of cancer-free subjects and wherein said expression profiles are determined using RT-PCR or nucleic acid arrays.

Baker et al teach methods of detecting an expression profile of an mRNA comprising SEQ ID NO:295 in colon cancer tissue that is 100% identical[5] to the instantly claimed SEQ ID NO:12 and comparing said expression profile to the expression profile of an mRNA comprising SEQ ID NO:295 from a cancer tissue reference expression profile set. Baker et al also teach methods of detecting an expression profile of an mRNA comprising SEQ ID NO:295 in lung cancer tissue that is 100% identical to the instantly claimed SEQ ID NO:12 and comparing said expression profile to the expression profile of an mRNA comprising SEQ ID NO:295 from a cancer tissue reference expression profile set; see entire document (e.g., column 2, lines 34-44, column 5, lines, 43-63) Baker et al also teach said expression profiles being determined using RT-PCR (see e.g., column 4, lines 43-60).

Baker et al do not expressly teach comparing the lung or colon cancer tissue expression profile to a corresponding normal tissue reference profile.

This deficiency is made up for in the teachings of Von Knebel Doebertiz et al.

Von Knebel Doebertiz et al teach that it is an obvious thing to compare an mRNA

[5] See the alignment of these sequences attached here as Exhibit D.

expression profile from a cancerous body sample with a corresponding mRNA expression profile from a body sample which originates from a healthy person) (see entire document, e.g., column 2 lines 45-48 and 59-60).

Therefore, it would have been *prima facie* obvious to one of ordinary skill in the art at the time the claimed invention was made to compare the expression profile of an mRNA comprising SEQ ID NO:12 in lung cancer tissues to the expression profile of an mRNA comprising SEQ ID NO:12 in corresponding normal lung tissue from subjects without cancer or to compare the expression profile of an mRNA comprising SEQ ID NO:12 in colon cancer tissues to the expression profile of an mRNA comprising SEQ ID NO:12 in corresponding normal colon tissue from subjects without cancer, in order to compare the expression profiles to determine whether said mRNA is overexpressed in the cancer tissue.

One of ordinary skill in the art would have been motivated to and had a reasonable expectation of success at the time the invention was made to detect an expression profile of a nucleic acid comprising SEQ ID NO:12 in a colon or lung cacner tissue from a human subject and comparing said expression profile to the expression profile of a nucleic acid comprising SEQ ID NO:12 from normal colon or lung tissue, respectively to determine whether said nucleic acid is overexpressed in the cancer tissue because Baker et al teach methods of detecting an mRNA that is 100% identical to SEQ ID NO:12 in colon and lung cancer tissue and Von Knebel Doebertiz et al teach that it is obvious to compare a tissue suspected of being cancerous with a corresponding normal tissue, in order to detect cancer markers overexpressed in the cancerous tissue.

With regard to claims 5 and 6, it is noted that Von Knebel Doebertiz et al do not expressly teach that the normal tissue expression profile is an "average" expression profile of said nucleic acid from cancer-free subjects. Nevertheless, it would have been *prima facie* obvious to one ordinarily skilled in the art at the time the invention was made to measure the expression profile of said at least one nucleic acid in more than one reference biological sample, and then determine the average value of the expression profiles of that nucleic acid in the samples, so as to compare the expression profile of

the nucleic acid in the colon cancer tissue and the average value in cancer-free colon tissue or to compare the expression profile of the nucleic acid in the lung cancer tissue and the average value in cancer-free lung tissue, because it would be recognized that the average value better reflects the standard level of expression in normal, non-cancerous colon or lung tissues. This is because it would be expected that the normal level of expression of any nucleic acid will vary in normal subjects, at least to some extent, such that the difference in the levels of expression in the colon or lung cancer tissue and any one specimen of the corresponding normal tissue might be more or less significant, which could lead the practitioner of the process to falsely conclude that the nucleic acid is or is not overexpressed in the cancerous tissue. Therefore, one ordinarily skilled in the art at the time the invention was made to would have been motivated to do so in order to more accurately determine whether or not the nucleic acid is overexpressed in the colon or lung cancer tissue, relative to the standard level of expression that occurs in the corresponding normal tissues.

Because Baker et al teach the expression profiles are determined using RT-PCR, it would have been *prima facie* obvious to determine the average value of the expression profiles of that nucleic acid in the samples using such methodology. One ordinarily skilled in the art would have been motivated to do so because such methodology was both routine and conventional at the time the invention was made, and was recognized to be very sensitive. Additionally, it is noted that Baker et al do not expressly teach using nucleic assay arrays to determine said expression profiles. Nevertheless, it would have been *prima facie* obvious to one ordinarily skilled in the art at the time the invention was made to measure the expression profiles by nucleic assay array or by RT-PCR as both technologies were recognized to be used in methods to provide mRNA expression profiles. One ordinarily skilled in the art would have been motivated to do so because both methodologies were routine and conventional at the time the invention was made, and were recognized to be used in methods to determine mRNA expression profiles.

Thus, there would be an advantage and a reasonable expectation of success in detecting an expression profile of a nucleic acid comprising SEQ ID NO:12 in a colon

cancer tissue from a human subject and comparing said expression profile to an average expression profile of a nucleic acid comprising SEQ ID NO:12 from colon tissue obtained from cancer-free subjects or in detecting an expression profile of a nucleic acid comprising SEQ ID NO:12 in a lung cancer tissue from a human subject and comparing said expression profile to an average expression profile of a nucleic acid comprising SEQ ID NO:12 from lung tissue obtained from cancer-free subjects using RT-PCR or nucleic acid array, to determine whether said nucleic acid is overexpressed in the cancer tissue, respectively, in view of US Patent 7,081,340 and US Patent 6,709,832.

***Conclusion***

20. No claim is allowed.

21. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

22. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brad Duffy whose telephone number is (571) 272-9935. The examiner can normally be reached on Monday through Friday 7:00 AM to 4:30 PM

with alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Larry Helms can be reached on (571) 272-0832. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Respectfully,
Brad Duffy
571-272-9935

/Stephen L. Rawlings/
Stephen L. Rawlings, Ph.D.
Primary Examiner, Art Unit 1643

bd
August 17, 2007

Exhibit A

<!--StartFragment-->RESULT 8
ACC72688
ID  ACC72688 standard; cDNA; 2119 BP.
XX
AC  ACC72688;
XX
DT  09-JUL-2003  (first entry)
XX
DE  Human cancer related protein encoding cDNA SEQ ID NO:27.
XX
KW  Human; cancer; diagnosis; screening; modulator; leukaemia; ischaemia;
KW  heart disease; atherosclerosis; endometriosis; gene; ss.
XX
OS  Homo sapiens.
XX
PN  WO2003025138-A2.
XX
PD  27-MAR-2003.
XX
PF  17-SEP-2002; 2002WO-US029560.
XX
PR  17-SEP-2001; 2001US-0323469P.
PR  20-SEP-2001; 2001US-0323887P.
PR  13-NOV-2001; 2001US-0350666P.
PR  08-FEB-2002; 2002US-0355145P.
PR  08-FEB-2002; 2002US-0355257P.
PR  12-APR-2002; 2002US-0372246P.
XX
PA  (EOSB-) EOS BIOTECHNOLOGY INC.
XX
PI  Afar D,  Aziz N,  Gish KC,  Hevezi PA,  Mack DH,  Wilson KE;
PI  Zlotnik A;
XX
DR  WPI; 2003-354600/33.
DR  P-PSDB; ABR58565.
XX
PT  New genes that are up-regulated or down-regulated in cancers, useful as
PT  markers for diagnosing e.g. cancer, ischemia or heart diseases, or as
PT  therapeutic targets for screening drugs for treating these diseases.
XX
PS  Claim 8; Page 641; 767pp; English.
XX
CC  The present invention describes an isolated nucleic acid molecule, which
CC  comprises the sequence of any of the genes that are up-regulated or down-
CC  regulated in specific cancers (e.g. about 1031 genes up-regulated in
CC  acute lymphocytic leukemia). ACC72641 to ACC72860 represent cancer
CC  related gene nucleotide sequences which encode the proteins given in
CC  ABR58521 to ABR58709. Also described: (1) determining the presence or
CC  absence of a pathological cell in a patient; (2) an expression vector
CC  comprising a nucleic acid molecule described above; (3) a host cell
CC  comprising the vector; (4) an isolated polypeptide, which is encoded by
CC  the nucleic acid; (5) an antibody that specifically binds the polypeptide
CC  of (4); (6) specifically targeting a compound to a pathological cell in a
CC  patient by administering to the patient the antibody above; and (7) a
CC  drug screening assay. The nucleic acid is useful as diagnostic markers or
CC  therapeutic targets. In particular, the nucleic acid is useful for
CC  diagnosing a pathology, e.g. cancer (e.g. cancer of the bone marrow,
CC  bladder, brain, breast, cervix, colon/rectum, kidney, lung, ovary,
CC  pancreas, prostate, skin and uterus), wounds, ischaemia, heart diseases,
CC  atherosclerosis and endometriosis. The nucleic acid is also useful in
CC  drug screening, particularly for identifying agents for treating these
CC  pathologies
XX
SQ  Sequence 2119 BP; 646 A; 389 C; 492 G; 592 T; 0 U; 0 Other;

  Query Match           100.0%;  Score 2119;  DB 10;  Length 2119;
  Best Local Similarity  100.0%;  Pred. No. 0;
  Matches 2119;  Conservative    0;  Mismatches    0;  Indels    0;  Gaps    0;

Qy          1 GGCACGAGTAGGGGTGGCGGGTCAGTGCTGCTCGGGGGCTTCTCCATCCAGGTCCCTGGA 60
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
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Qy         61 GTTCCTGGTCCCTGGAGCTCCGCACTTGGCGCGCAACCTGCGTGAGGCAGCGCGACTCTG 120
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db         61 GTTCCTGGTCCCTGGAGCTCCGCACTTGGCGCGCAACCTGCGTGAGGCAGCGCGACTCTG 120

```
Qy       121 GCGACTGGCCGGCCATGCCTTCCCGGGCTGAGGACTATGAAGTGTTGTACACCATTGGCA 180
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Db       121 GCGACTGGCCGGCCATGCCTTCCCGGGCTGAGGACTATGAAGTGTTGTACACCATTGGCA 180

Qy       181 CAGGCTCCTACGGCCGCTGCCAGAAGATCCGGAGGAAGAGTGATGGCAAGATATTAGTTT 240
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Db       181 CAGGCTCCTACGGCCGCTGCCAGAAGATCCGGAGGAAGAGTGATGGCAAGATATTAGTTT 240

Qy       241 GGAAAGAACTTGACTATGGCTCCATGACAGAAGCTGAGAAACAGATGCTTGTTTCTGAAG 300
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Qy       301 TGAATTTGCTTCGTGAACTGAAACATCCAAACATCGTTCGTTACTATGATCGGATTATTG 360
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Qy       361 ACCGGACCAATACAACACTGTACATTGTAATGGAATATTGTGAAGGAGGGGATCTGGCTA 420
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Db       361 ACCGGACCAATACAACACTGTACATTGTAATGGAATATTGTGAAGGAGGGGATCTGGCTA 420

Qy       421 GTGTAATTACAAAGGGAACCAAGGAAAGGCAATACTTAGATGAAGAGTTTGTTCTTCGAG 480
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Qy       481 TGATGACTCAGTTGACTCTGGCCCTGAAGGAATGCCACAGACGAAGTGATGGTGGTCATA 540
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Qy       541 CCGTATTGCATCGGGATCTTAAACCAGCCAATGTTTTCCTGGATGGCAAGCAAAACGTCA 600
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Qy       601 AGCTTGGAGACTTTGGGCTAGCTAGAATATTAAACCATGACACGAGTTTTGCAAAAACAT 660
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Qy       661 TTGTTGGCACACCTTATTACATGTCTCCTGAACAAATGAATCGCATGTCCTACAATGAGA 720
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Db       661 TTGTTGGCACACCTTATTACATGTCTCCTGAACAAATGAATCGCATGTCCTACAATGAGA 720

Qy       721 AATCAGATATCTGGTCATTGGGCTGCTTGCTGTATGAGTTATGTGCATTAATGCCTCCAT 780
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       721 AATCAGATATCTGGTCATTGGGCTGCTTGCTGTATGAGTTATGTGCATTAATGCCTCCAT 780

Qy       781 TTACAGCTTTTAGCCAGAAAGAACTCGCTGGGAAAATCAGAGAAGGCAAATTCAGGCGAA 840
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Db       781 TTACAGCTTTTAGCCAGAAAGAACTCGCTGGGAAAATCAGAGAAGGCAAATTCAGGCGAA 840

Qy       841 TTCCATACCGTTACTCTGATGAATTGAATGAAATTATTACGAGGATGTTAAACTTAAAGG 900
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Db       841 TTCCATACCGTTACTCTGATGAATTGAATGAAATTATTACGAGGATGTTAAACTTAAAGG 900

Qy       901 ATTACCATCGACCTTCTGTTGAAGAAATTCTTGAGAACCCTTTAATAGCAGATTTGGTTG 960
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Qy       961 CAGACGAGCAAAGAAGAAATCTTGAGAGAAGAGGGCGACAATTAGGAGAGCCAGAAAAAT 1020
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Db       961 CAGACGAGCAAAGAAGAAATCTTGAGAGAAGAGGGCGACAATTAGGAGAGCCAGAAAAAT 1020

Qy      1021 CGCAGGATTCCAGCCCTGTATTGAGTGAGCTGAAACTGAAGGAAATTCAGTTACAGGAGC 1080
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Db      1021 CGCAGGATTCCAGCCCTGTATTGAGTGAGCTGAAACTGAAGGAAATTCAGTTACAGGAGC 1080

Qy      1081 GAGAGCGAGCTCTCAAAGCAAGAGAAGAAAGATTGGAGCAGAAAGAACAGGAGCTTTGTG 1140
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Qy      1141 TTCGTGAGAGACTAGCAGAGGACAAACTGGCTAGAGCAGAAAATCTGTTGAAGAACTACA 1200
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Qy      1201 GCTTGCTAAAGGAACGGAAGTTCCTGTCTCTGGCAAGTAATCCAGAACTTCTTAATCTTC 1260
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Qy       1261 CATCCTCAGTAATTAAGAAGAAAGTTCATTTCAGTGGGGAAAGTAAAGAGAACATCATGA 1320
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Qy       1321 GGAGTGAGAATTCTGAGAGTCAGCTCACATCTAAGTCCAAGTGCAAGGACCTGAAGAAAA 1380
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Qy       1381 GGCTTCACGCTGCCCAGCTGCGGGCTCAAGCCCTGTCAGATATTGAGAAAAATTACCAAC 1440
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Qy       1441 TGAAAAGCAGACAGATCCTGGGCATGCGCTAGCCAGGTAGAGAGACACAGAGCTGTGTAC 1500
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Qy       1501 AGGATGTAATATTACCAACCTTTAAAGACTGATATTCAAATGCTGTAGTGTTGAATACTT 1560
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Db       1501 AGGATGTAATATTACCAACCTTTAAAGACTGATATTCAAATGCTGTAGTGTTGAATACTT 1560

Qy       1561 GGCCCCATGAGCCATGCCTTTCTGTATAGTACACATGATATTTCGGAATTGGTTTTACTG 1620
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Qy       1621 TTCTTCAGCAACTATTGTACAAAATGTTCACATTTAATTTTTCTTTCTTCTTTTAAGAAC 1680
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Qy       1681 ATATTATAAAAAGAATACTTTCTTGGTTGGGCTTTTAATCCTGTGTGTGATTACTAGTAG 1740
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Qy       1741 GAACATGAGATGTGACATTCTAAATCTTGGGAGAAAAAATAATATTAGGAAAAAAATATT 1800
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Qy       1801 TATGCAGGAAGAGTAGCACTCACTGAATAGTTTTAAATGACTGAGTGGTATGCTTACAAT 1860
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Qy       1861 TGTCATGTCTAGATTTAAATTTTAAGTCTGAGATTTTAAATGTTTTTGAGCTTAGAAAAC 1920
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Qy       1921 CCAGTTAGATGCAATTTGGTCATTAATACCATGACATCTTGCTTATAAATATTCCATTGC 1980
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Db       1921 CCAGTTAGATGCAATTTGGTCATTAATACCATGACATCTTGCTTATAAATATTCCATTGC 1980

Qy       1981 TCTGTAGTTCAAATCTGTTAGCTTTGTGAAAATTCATCACTGTGATGTTTGTATTCTTTT 2040
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Db       1981 TCTGTAGTTCAAATCTGTTAGCTTTGTGAAAATTCATCACTGTGATGTTTGTATTCTTTT 2040

Qy       2041 TTTTTTTCTGTTTAACAGAATATGAGCTGTCTGTCATTTACCTACTTCTTTCCCACTAAA 2100
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Db       2041 TTTTTTTCTGTTTAACAGAATATGAGCTGTCTGTCATTTACCTACTTCTTTCCCACTAAA 2100

Qy       2101 TAAAAGAATTCTTCAGTTA 2119
             ||||||||||||||||||
Db       2101 TAAAAGAATTCTTCAGTTA 2119
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<!--EndFragment-->

Exhibit B

```
<!--StartFragment-->RESULT 3
US-09-029-047C-1
; Sequence 1, Application US/09029047C
; Patent No. 6632936
; GENERAL INFORMATION:
;  APPLICANT: Carr, Antony M.
;  TITLE OF INVENTION: Cell-Cycle Checkpoint Genes
;  FILE REFERENCE: 27866/34132
;  CURRENT APPLICATION NUMBER: US/09/029,047C
;  CURRENT FILING DATE:  1999-05-11
;  PRIOR APPLICATION NUMBER: PCT/GB96/02197
;  PRIOR FILING DATE: 1996-09-06
;  PRIOR APPLICATION NUMBER: GB 9518220.0
;  PRIOR FILING DATE: 1995-09-06
;  NUMBER OF SEQ ID NOS: 14
;  SOFTWARE: PatentIn Ver. 3.1
; SEQ ID NO 1
;   LENGTH: 8239
;   TYPE: DNA
;   ORGANISM: Homo sapiens
;   FEATURE:
;   NAME/KEY: CDS
;   LOCATION: (80)..(8011)
US-09-029-047C-1

  Query Match          99.7%;  Score 8237.4;  DB 3;  Length 8239;
  Best Local Similarity   99.9%;  Pred. No. 0;
  Matches 8238;  Conservative    0;  Mismatches    1;  Indels    0;  Gaps    0;

Qy         27 GCGCTCTTCCGGCAGCGGTACGTTTGGAGACGCCGGGAACCCGCGTTGGCGTGGTTGACT 86
               ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db          1 GCGCTCTTCCGGCAGCGGTACGTTTGGAGACGCCGGGAACCCGCGTTGGCGTGGTTGACT 60

Qy         87 AGTGCCTCGCAGCCTCAGCATGGGGGAACATGGCCTGGAGCTGGCTTCCATGATCCCCGC 146
               ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
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Qy        147 CCTGCGGGAGCTGGGCAGTGCCACACCAGAGGAATATAATACAGTTGTACAGAAGCCAAG 206
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Qy        207 ACAAATTCTGTGTCAATTCATTGACCGGATACTTACAGATGTAAATGTTGTTGCTGTAGA 266
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Qy        267 ACTTGTAAAGAAAACTGACTCTCAGCCAACCTCCGTGATGTTGCTTGATTTCATCCAGCA 326
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Db        241 ACTTGTAAAGAAAACTGACTCTCAGCCAACCTCCGTGATGTTGCTTGATTTCATCCAGCA 300

Qy        327 TATCATGAAATCCTCCCCACTTATGTTTGTAAATGTGAGTGGAAGCCATGAGCGCAAAGG 386
               ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        301 TATCATGAAATCCTCCCCACTTATGTTTGTAAATGTGAGTGGAAGCCATGAGCGCAAAGG 360

Qy        387 CAGTTGTATTGAATTCAGTAATTGGATCATAACGAGACTTCTGCGGATTGCAGCAACTCC 446
               ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        361 CAGTTGTATTGAATTCAGTAATTGGATCATAACGAGACTTCTGCGGATTGCAGCAACTCC 420

Qy        447 CTCCTGTCATTTGTTACACAAGAAAATCTGTGAAGTCATCTGTTCATTATTATTTCTTTT 506
               ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        421 CTCCTGTCATTTGTTACACAAGAAAATCTGTGAAGTCATCTGTTCATTATTATTTCTTTT 480

Qy        507 TAAAAGCAAGAGTCCTGCTATTTTTGGGGTACTCACAAAAGAATTATTACAACTTTTTGA 566
               ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        481 TAAAAGCAAGAGTCCTGCTATTTTTGGGGTACTCACAAAAGAATTATTACAACTTTTTGA 540

Qy        567 AGACTTGGTTTACCTCCATAGAAGAAATGTGATGGGTCATGCTGTGGAATGGCCAGTGGT 626
               ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        541 AGACTTGGTTTACCTCCATAGAAGAAATGTGATGGGTCATGCTGTGGAATGGCCAGTGGT 600

Qy        627 CATGAGCCGATTTTTAAGTCAATTAGATGAACACATGGGATATTTACAATCAGCTCCTTT 686
               ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        601 CATGAGCCGATTTTTAAGTCAATTAGATGAACACATGGGATATTTACAATCAGCTCCTTT 660

Qy        687 GCAGTTGATGAGTATGCAAAATTTAGAATTTATTGAAGTCACTTTATTAATGGTTCTTAC 746
               ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        661 GCAGTTGATGAGTATGCAAAATTTAGAATTTATTGAAGTCACTTTATTAATGGTTCTTAC 720
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Qy       747 TCGTATTATTGCAATTGTGTTTTTTAGAAGGCAAGAACTCTTACTTTGGCAGATAGGTTG 806
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       721 TCGTATTATTGCAATTGTGTTTTTTAGAAGGCAAGAACTCTTACTTTGGCAGATAGGTTG 780

Qy       807 TGTTCTGCTAGAGTATGGTAGTCCAAAAATTAAATCCCTAGCAATTAGCTTTTTAACAGA 866
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       781 TGTTCTGCTAGAGTATGGTAGTCCAAAAATTAAATCCCTAGCAATTAGCTTTTTAACAGA 840

Qy       867 ACTTTTTCAGCTTGGAGGACTACCAGCACAACCAGCTAGCACTTTTTTCAGCTCATTTTT 926
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       841 ACTTTTTCAGCTTGGAGGACTACCAGCACAACCAGCTAGCACTTTTTTCAGCTCATTTTT 900

Qy       927 GGAATTATTAAAACACCTTGTAGAAATGGATACTGACCAATTGAAACTCTATGAAGAGCC 986
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       901 GGAATTATTAAAACACCTTGTAGAAATGGATACTGACCAATTGAAACTCTATGAAGAGCC 960

Qy       987 ATTATCAAAGCTGATAAAGACACTATTTCCCTTTGAAGCAGAAGCTTATAGAAATATTGA 1046
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       961 ATTATCAAAGCTGATAAAGACACTATTTCCCTTTGAAGCAGAAGCTTATAGAAATATTGA 1020

Qy      1047 ACCTGTCTATTTAAATATGCTGCTGGAAAAACTCTGTGTCATGTTTGAAGACGGTGTGCT 1106
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      1021 ACCTGTCTATTTAAATATGCTGCTGGAAAAACTCTGTGTCATGTTTGAAGACGGTGTGCT 1080

Qy      1107 CATGCGGCTTAAGTCTGATTTGCTAAAAGCAGCTTTGTGCCATTTACTGCAGTATTTCCT 1166
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      1081 CATGCGGCTTAAGTCTGATTTGCTAAAAGCAGCTTTGTGCCATTTACTGCAGTATTTCCT 1140

Qy      1167 TAAATTTGTGCCAGCTGGGTATGAATCTGCTTTACAAGTCAGGAAGGTCTATGTGAGAAA 1226
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      1141 TAAATTTGTGCCAGCTGGGTATGAATCTGCTTTACAAGTCAGGAAGGTCTATGTGAGAAA 1200

Qy      1227 TATTTGTAAAGCTCTTTTGGATGTGCTTGGAATTGAGGTAGATGCAGAGTACTTGTTGGG 1286
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      1201 TATTTGTAAAGCTCTTTTGGATGTGCTTGGAATTGAGGTAGATGCAGAGTACTTGTTGGG 1260

Qy      1287 CCCACTTTATGCAGCTTTGAAAATGGAAAGTATGGAAATCATTGAGGAGATTCAATGCCA 1346
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      1261 CCCACTTTATGCAGCTTTGAAAATGGAAAGTATGGAAATCATTGAGGAGATTCAATGCCA 1320

Qy      1347 AACTCAACAGGAAAACCTCAGCAGTAATAGTGATGGAATATCACCCAAAAGGCGTCGTCT 1406
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      1321 AACTCAACAGGAAAACCTCAGCAGTAATAGTGATGGAATATCACCCAAAAGGCGTCGTCT 1380

Qy      1407 CAGCTCGTCTCTAAACCCTTCTAAAAGAGCACCAAAACAGACTGAGGAAATTAAACATGT 1466
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      1381 CAGCTCGTCTCTAAACCCTTCTAAAAGAGCACCAAAACAGACTGAGGAAATTAAACATGT 1440

Qy      1467 GGACATGAACCAAAAGAGCATATTATGGAGTGCACTGAAACAGAAAGCTGAATCCCTTCA 1526
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      1441 GGACATGAACCAAAAGAGCATATTATGGAGTGCACTGAAACAGAAAGCTGAATCCCTTCA 1500

Qy      1527 GATTTCCCTTGAATACAGTGGCCTAAAGAATCCTGTTATTGAGATGTTAGAAGGAATTGC 1586
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      1501 GATTTCCCTTGAATACAGTGGCCTAAAGAATCCTGTTATTGAGATGTTAGAAGGAATTGC 1560

Qy      1587 TGTTGTCTTACAACTGACTGCTCTGTGTACTGTTCATTGTTCTCATCAAAACATGAACTG 1646
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      1561 TGTTGTCTTACAACTGACTGCTCTGTGTACTGTTCATTGTTCTCATCAAAACATGAACTG 1620

Qy      1647 CCGTACTTTCAAGGACTGTCAACATAAATCCAAGAAGAAACCTTCTGTAGTGATAACTTG 1706
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      1621 CCGTACTTTCAAGGACTGTCAACATAAATCCAAGAAGAAACCTTCTGTAGTGATAACTTG 1680

Qy      1707 GATGTCATTGGATTTTTACACAAAAGTGCTTAAGAGCTGTAGAAGTTTGTTAGAATCTGT 1766
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      1681 GATGTCATTGGATTTTTACACAAAAGTGCTTAAGAGCTGTAGAAGTTTGTTAGAATCTGT 1740

Qy      1767 TCAGAAACTGGACCTGGAGGCAACCATTGATAAGGTGGTGAAAATTTATGATGCTTTGAT 1826
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      1741 TCAGAAACTGGACCTGGAGGCAACCATTGATAAGGTGGTGAAAATTTATGATGCTTTGAT 1800

Qy      1827 TTATATGCAAGTAAACAGTTCATTTGAAGATCATATCCTGGAAGATTTATGTGGTATGCT 1886
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      1801 TTATATGCAAGTAAACAGTTCATTTGAAGATCATATCCTGGAAGATTTATGTGGTATGCT 1860
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Qy      1887 CTCACTTCCATGGATTTATTCCCATTCTGATGATGGCTGTTTAAAGTTGACCACATTTGC 1946
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      1861 CTCACTTCCATGGATTTATTCCCATTCTGATGATGGCTGTTTAAAGTTGACCACATTTGC 1920

Qy      1947 CGCTAATCTTCTAACATTAAGCTGTAGGATTTCAGATAGCTATTCACCACAGGCACAATC 2006
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      1921 CGCTAATCTTCTAACATTAAGCTGTAGGATTTCAGATAGCTATTCACCACAGGCACAATC 1980

Qy      2007 ACGATGTGTGTTTCTTCTGACTCTGTTTCCAAGAAGAATATTCCTTGAGTGGAGAACAGC 2066
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      1981 ACGATGTGTGTTTCTTCTGACTCTGTTTCCAAGAAGAATATTCCTTGAGTGGAGAACAGC 2040

Qy      2067 AGTTTACAACTGGGCCCTGCAGAGCTCCCATGAAGTAATCCGGGCTAGTTGTGTTAGTGG 2126
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      2041 AGTTTACAACTGGGCCCTGCAGAGCTCCCATGAAGTAATCCGGGCTAGTTGTGTTAGTGG 2100

Qy      2127 ATTTTTTATCTTATTGCAGCAGCAGAATTCTTGTAACAGAGTTCCCAAGATTCTTATAGA 2186
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      2101 ATTTTTTATCTTATTGCAGCAGCAGAATTCTTGTAACAGAGTTCCCAAGATTCTTATAGA 2160

Qy      2187 TAAAGTCAAAGATGATTCTGACATTGTCAAGAAAGAATTTGCTTCTATACTTGGTCAACT 2246
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      2161 TAAAGTCAAAGATGATTCTGACATTGTCAAGAAAGAATTTGCTTCTATACTTGGTCAACT 2220

Qy      2247 TGTCTGTACTCTTCACGGCATGTTTTATCTGACAAGTTCTTTAACAGAACCTTTCTCTGA 2306
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      2221 TGTCTGTACTCTTCACGGCATGTTTTATCTGACAAGTTCTTTAACAGAACCTTTCTCTGA 2280

Qy      2307 ACACGGACATGTGGACCTCTTCTGTAGGAACTTGAAAGCCACTTCTCAACATGAATGTTC 2366
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      2281 ACACGGACATGTGGACCTCTTCTGTAGGAACTTGAAAGCCACTTCTCAACATGAATGTTC 2340

Qy      2367 ATCTTCTCAACTAAAAGCTTCTGTCTGCAAGCCATTCCTTTTCCTACTGAAAAAAAAAAT 2426
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      2341 ATCTTCTCAACTAAAAGCTTCTGTCTGCAAGCCATTCCTTTTCCTACTGAAAAAAAAAAT 2400

Qy      2427 ACCTAGTCCAGTAAAACTTGCTTTCATAGATAATCTACATCATCTTTGTAAGCATCTTGA 2486
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      2401 ACCTAGTCCAGTAAAACTTGCTTTCATAGATAATCTACATCATCTTTGTAAGCATCTTGA 2460

Qy      2487 TTTTAGAGAAGATGAAACAGATGTAAAAGCAGTTCTTGGAACTTTATTAAATTTAATGGA 2546
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      2461 TTTTAGAGAAGATGAAACAGATGTAAAAGCAGTTCTTGGAACTTTATTAAATTTAATGGA 2520

Qy      2547 AGATCCAGACAAAGATGTTAGAGTGGCTTTTAGTGGAAATATCAAGCACATATTGGAATC 2606
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      2521 AGATCCAGACAAAGATGTTAGAGTGGCTTTTAGTGGAAATATCAAGCACATATTGGAATC 2580

Qy      2607 CTTGGACTCTGAAGATGGATTTATAAAGGAGCTTTTTGTCTTAAGAATGAAGGAAGCATA 2666
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      2581 CTTGGACTCTGAAGATGGATTTATAAAGGAGCTTTTTGTCTTAAGAATGAAGGAAGCATA 2640

Qy      2667 TACACATGCCCAAATATCAAGAAATAATGAGCTGAAGGATACCTTGATTCTTACAACAGG 2726
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      2641 TACACATGCCCAAATATCAAGAAATAATGAGCTGAAGGATACCTTGATTCTTACAACAGG 2700

Qy      2727 GGATATTGGAAGGGCCGCAAAAGGAGATTTGGTACCATTTGCACTCTTACACTTATTGCA 2786
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      2701 GGATATTGGAAGGGCCGCAAAAGGAGATTTGGTACCATTTGCACTCTTACACTTATTGCA 2760

Qy      2787 TTGTTTGTTATCCAAGTCAGCATCTGTCTCTGGAGCAGCATACACAGAAATTAGAGCTCT 2846
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      2761 TTGTTTGTTATCCAAGTCAGCATCTGTCTCTGGAGCAGCATACACAGAAATTAGAGCTCT 2820

Qy      2847 GGTTGCAGCTAAAAGTGTTAAACTGCAAAGTTTTTTCAGCCAGTATAAGAAACCCATCTG 2906
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      2821 GGTTGCAGCTAAAAGTGTTAAACTGCAAAGTTTTTTCAGCCAGTATAAGAAACCCATCTG 2880

Qy      2907 TCAGTTTTTGGTAGAATCCCTTCACTCTAGTCAGATGACAGCACTTCCGAATACTCCATG 2966
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      2881 TCAGTTTTTGGTAGAATCCCTTCACTCTAGTCAGATGACAGCACTTCCGAATACTCCATG 2940

Qy      2967 CCAGAATGCTGACGTGCGAAAACAAGATGTGGCTCACCAGAGAGAAATGGCTTTAAATAC 3026
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      2941 CCAGAATGCTGACGTGCGAAAACAAGATGTGGCTCACCAGAGAGAAATGGCTTTAAATAC 3000
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Qy      3027 GTTGTCTGAAATTGCCAACGTTTTCGACTTTCCTGATCTTAATCGTTTTCTTACTAGGAC 3086
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      3001 GTTGTCTGAAATTGCCAACGTTTTCGACTTTCCTGATCTTAATCGTTTTCTTACTAGGAC 3060

Qy      3087 ATTACAAGTTCTACTACCTGATCTTGCTGCCAAAGCAAGCCCTGCAGCTTCTGCTCTCAT 3146
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      3061 ATTACAAGTTCTACTACCTGATCTTGCTGCCAAAGCAAGCCCTGCAGCTTCTGCTCTCAT 3120

Qy      3147 TCGAACTTTAGGAAAACAATTAAATGTCAATCGTAGAGAGATTTTAATAAACAACTTCAA 3206
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      3121 TCGAACTTTAGGAAAACAATTAAATGTCAATCGTAGAGAGATTTTAATAAACAACTTCAA 3180

Qy      3207 ATATATTTTTTCTCATTTGGTCTGTTCTTGTTCCAAAGATGAATTAGAACGTGCCCTTCA 3266
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      3181 ATATATTTTTTCTCATTTGGTCTGTTCTTGTTCCAAAGATGAATTAGAACGTGCCCTTCA 3240

Qy      3267 TTATCTGAAGAATGAAACAGAAATTGAACTGGGGAGCCTGTTGAGACAAGATTTCCAAGG 3326
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      3241 TTATCTGAAGAATGAAACAGAAATTGAACTGGGGAGCCTGTTGAGACAAGATTTCCAAGG 3300

Qy      3327 ATTGCATAATGAATTATTGCTGCGTATTGGAGAACACTATCAACAGGTTTTTAATGGTTT 3386
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      3301 ATTGCATAATGAATTATTGCTGCGTATTGGAGAACACTATCAACAGGTTTTTAATGGTTT 3360

Qy      3387 GTCAATACTTGCCTCATTTGCATCCAGTGATGATCCATATCAGGGCCCGAGAGATATCAT 3446
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      3361 GTCAATACTTGCCTCATTTGCATCCAGTGATGATCCATATCAGGGCCCGAGAGATATCAT 3420

Qy      3447 ATCACCTGAACTGATGGCTGATTATTTACAACCCAAATTGTTGGGCATTTTGGCTTTTTT 3506
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      3421 ATCACCTGAACTGATGGCTGATTATTTACAACCCAAATTGTTGGGCATTTTGGCTTTTTT 3480

Qy      3507 TAACATGCAGTTACTGAGCTCTAGTGTTGGCATTGAAGATAAGAAAATGGCCTTGAACAG 3566
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      3481 TAACATGCAGTTACTGAGCTCTAGTGTTGGCATTGAAGATAAGAAAATGGCCTTGAACAG 3540

Qy      3567 TTTGATGTCTTTGATGAAGTTAATGGGACCCAAACATGTCAGTTCTGTGAGGGTGAAGAT 3626
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      3541 TTTGATGTCTTTGATGAAGTTAATGGGACCCAAACATGTCAGTTCTGTGAGGGTGAAGAT 3600

Qy      3627 GATGACCACACTGAGAACTGGCCTTCGATTCAAGGATGATTTTCCTGAATTGTGTTGCAG 3686
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      3601 GATGACCACACTGAGAACTGGCCTTCGATTCAAGGATGATTTTCCTGAATTGTGTTGCAG 3660

Qy      3687 AGCTTGGGACTGCTTTGTTCGCTGCCTGGATCATGCTTGTCTGGGCTCCCTTCTCAGTCA 3746
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      3661 AGCTTGGGACTGCTTTGTTCGCTGCCTGGATCATGCTTGTCTGGGCTCCCTTCTCAGTCA 3720

Qy      3747 TGTAATAGTAGCTTTGTTACCTCTTATACACATCCAGCCTAAAGAAACTGCAGCTATCTT 3806
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      3721 TGTAATAGTAGCTTTGTTACCTCTTATACACATCCAGCCTAAAGAAACTGCAGCTATCTT 3780

Qy      3807 CCACTACCTCATAATTGAAAACAGGGATGCTGTGCAAGATTTTCTTCATGAAATATATTT 3866
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      3781 CCACTACCTCATAATTGAAAACAGGGATGCTGTGCAAGATTTTCTTCATGAAATATATTT 3840

Qy      3867 TTTACCTGATCATCCAGAATTAAAAAAAGATAAAAGCCGTTCTCCAGGAATACAGAAAGGA 3926
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      3841 TTTACCTGATCATCCAGAATTAAAAAAAGATAAAAGCCGTTCTCCAGGAATACAGAAAGGA 3900

Qy      3927 GACCTCTGAGAGCACTGATCTTCAGACAACTCTTCAGCTCTCTATGAAGGCCATTCAACA 3986
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      3901 GACCTCTGAGAGCACTGATCTTCAGACAACTCTTCAGCTCTCTATGAAGGCCATTCAACA 3960

Qy      3987 TGAAAATGTCGATGTTCGTATTCATGCTCTTACAAGCTTGAAGGAAACCTTGTATAAAAA 4046
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      3961 TGAAAATGTCGATGTTCGTATTCATGCTCTTACAAGCTTGAAGGAAACCTTGTATAAAAA 4020

Qy      4047 TCAGGAAAAACTGATAAAGTATGCAACAGACAGTGAAACAGTAGAACCTATTATCTCACA 4106
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      4021 TCAGGAAAAACTGATAAAGTATGCAACAGACAGTGAAACAGTAGAACCTATTATCTCACA 4080

Qy      4107 GTTGGTGACAGTGCTTTTGAAAGGTTGCCAAGATGCAAACTCTCAAGCTCGGTTGCTCTG 4166
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      4081 GTTGGTGACAGTGCTTTTGAAAGGTTGCCAAGATGCAAACTCTCAAGCTCGGTTGCTCTG 4140
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Qy      4167 TGGGGAATGTTTAGGGGAATTGGGGGCGATAGATCCAGGTCGATTAGATTTCTCAACAAC 4226
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      4141 TGGGGAATGTTTAGGGGAATTGGGGGCGATAGATCCAGGTCGATTAGATTTCTCAACAAC 4200

Qy      4227 TGAAACTCAAGGAAAAGATTTTACATTTGTGACTGGAGTAGAAGATTCAAGCTTTGCCTA 4286
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      4201 TGAAACTCAAGGAAAAGATTTTACATTTGTGACTGGAGTAGAAGATTCAAGCTTTGCCTA 4260

Qy      4287 TGGATTATTGATGGAGCTAACAAGAGCTTACCTTGCGTATGCTGATAATAGCCGAGCTCA 4346
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      4261 TGGATTATTGATGGAGCTAACAAGAGCTTACCTTGCGTATGCTGATAATAGCCGAGCTCA 4320

Qy      4347 AGATTCAGCTGCCTATGCCATTCAGGAGTTGCTTTCTATTTATGACTGTAGAGAGATGGA 4406
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      4321 AGATTCAGCTGCCTATGCCATTCAGGAGTTGCTTTCTATTTATGACTGTAGAGAGATGGA 4380

Qy      4407 GACCAACGGCCCAGGTCACCAATTGTGGAGGAGATTTCCTGAGCATGTTCGGGAAATACT 4466
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      4381 GACCAACGGCCCAGGTCACCAATTGTGGAGGAGATTTCCTGAGCATGTTCGGGAAATACT 4440

Qy      4467 AGAACCTCATCTAAATACCAGATACAAGAGTTCTCAGAAGTCAACCGATTGGTCTGGAGT 4526
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      4441 AGAACCTCATCTAAATACCAGATACAAGAGTTCTCAGAAGTCAACCGATTGGTCTGGAGT 4500

Qy      4527 AAAGAAGCCAATTTACTTAAGTAAATTGGGTAGTAACTTTGCAGAATGGTCAGCATCTTG 4586
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      4501 AAAGAAGCCAATTTACTTAAGTAAATTGGGTAGTAACTTTGCAGAATGGTCAGCATCTTG 4560

Qy      4587 GGCAGGTTATCTTATTACAAAGGTTCGACATGATCTTGCCAGTAAAATTTTCACCTGCTG 4646
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      4561 GGCAGGTTATCTTATTACAAAGGTTCGACATGATCTTGCCAGTAAAATTTTCACCTGCTG 4620

Qy      4647 TAGCATTATGATGAAGCATGATTTCAAAGTGACCATCTATCTTCTTCCACATATTCTGGT 4706
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      4621 TAGCATTATGATGAAGCATGATTTCAAAGTGACCATCTATCTTCTTCCACATATTCTGGT 4680

Qy      4707 GTATGTCTTACTGGGTTGTAATCAAGAAGATCAGCAGGAGGTTTATGCAGAAATTATGGC 4766
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      4681 GTATGTCTTACTGGGTTGTAATCAAGAAGATCAGCAGGAGGTTTATGCAGAAATTATGGC 4740

Qy      4767 AGTTCTAAAGCATGACGATCAGCATACCATAAATACCCAAGACATTGCATCTGATCTGTG 4826
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      4741 AGTTCTAAAGCATGACGATCAGCATACCATAAATACCCAAGACATTGCATCTGATCTGTG 4800

Qy      4827 TCAACTCAGTACACAGACTGTGTTCTCCATGCTTGACCATCTCACACAGTGGGCAAGGCA 4886
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      4801 TCAACTCAGTACACAGACTGTGTTCTCCATGCTTGACCATCTCACACAGTGGGCAAGGCA 4860

Qy      4887 CAAATTTCAGGCACTGAAAGCTGAGAAATGTCCACACAGCAAATCAAACAGAAATAAGGT 4946
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      4861 CAAATTTCAGGCACTGAAAGCTGAGAAATGTCCACACAGCAAATCAAACAGAAATAAGGT 4920

Qy      4947 AGACTCAATGGTATCTACTGTGGATTATGAAGACTATCAGAGTGTAACCCGTTTTCTAGA 5006
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      4921 AGACTCAATGGTATCTACTGTGGATTATGAAGACTATCAGAGTGTAACCCGTTTTCTAGA 4980

Qy      5007 CCTCATACCCCAGGATACTCTGGCAGTAGCTTCCTTTCGCTCCAAAGCATACACACGAGC 5066
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      4981 CCTCATACCCCAGGATACTCTGGCAGTAGCTTCCTTTCGCTCCAAAGCATACACACGAGC 5040

Qy      5067 TGTAATGCACTTTGAATCATTTATTACAGAAAAGAAGCAAAATATTCAGGAACATCTTGG 5126
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      5041 TGTAATGCACTTTGAATCATTTATTACAGAAAAGAAGCAAAATATTCAGGAACATCTTGG 5100

Qy      5127 ATTTTTACAGAAATTGTATGCTGCTATGCATGAACCTGATGGAGTGGCCGGAGTCAGTGC 5186
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      5101 ATTTTTACAGAAATTGTATGCTGCTATGCATGAACCTGATGGAGTGGCCGGAGTCAGTGC 5160

Qy      5187 AATTAGAAAGGCAGAACCATCTCTAAAAGAACAGATCCTTGAACATGAAAGCCTTGGCTT 5246
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      5161 AATTAGAAAGGCAGAACCATCTCTAAAAGAACAGATCCTTGAACATGAAAGCCTTGGCTT 5220

Qy      5247 GCTGAGGGATGCCACTGCTTGTTATGACAGGGCTATTCAGCTAGAACCAGACCAGATCAT 5306
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      5221 GCTGAGGGATGCCACTGCTTGTTATGACAGGGCTATTCAGCTAGAACCAGACCAGATCAT 5280
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Qy       5307 TCATTATCATGGTGTAGTAAAGTCCATGTTAGGTCTTGGTCAGCTGTCTACTGTTATCAC 5366
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       5281 TCATTATCATGGTGTAGTAAAGTCCATGTTAGGTCTTGGTCAGCTGTCTACTGTTATCAC 5340

Qy       5367 TCAGGTGAATGGAGTGCATGCTAACAGGTCCGAGTGGACAGATGAATTAAACACGTACAG 5426
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       5341 TCAGGTGAATGGAGTGCATGCTAACAGGTCCGAGTGGACAGATGAATTAAACACGTACAG 5400

Qy       5427 AGTGGAAGCAGCTTGGAAATTGTCACAGTGGGATTTGGTGGAAAACTATTTGGCAGCAGA 5486
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Db       5401 AGTGGAAGCAGCTTGGAAATTGTCACAGTGGGATTTGGTGGAAAACTATTTGGCAGCAGA 5460

Qy       5487 TGGAAAATCTACAACATGGAGTGTCAGACTGGGACAGCTATTATTATCAGCCAAAAAAAG 5546
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       5461 TGGAAAATCTACAACATGGAGTGTCAGACTGGGACAGCTATTATTATCAGCCAAAAAAAG 5520

Qy       5547 AGATATCACAGCTTTTTATGACTCACTGAAACTAGTGAGAGCAGAACAAATTGTACCTCT 5606
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Db       5521 AGATATCACAGCTTTTTATGACTCACTGAAACTAGTGAGAGCAGAACAAATTGTACCTCT 5580

Qy       5607 TTCAGCTGCAAGCTTTGAAAGAGGCTCCTACCAACGAGGATATGAATATATTGTGAGATT 5666
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       5581 TTCAGCTGCAAGCTTTGAAAGAGGCTCCTACCAACGAGGATATGAATATATTGTGAGATT 5640

Qy       5667 GCACATGTTATGTGAGTTGGAGCATAGCATCAAACCACTTTTCCAGCATTCTCCAGGTGA 5726
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       5641 GCACATGTTATGTGAGTTGGAGCATAGCATCAAACCACTTTTCCAGCATTCTCCAGGTGA 5700

Qy       5727 CAGTTCTCAAGAAGATTCTCTAAACTGGGTAGCTCGACTAGAAATGACCCAGAATTCCTA 5786
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Db       5701 CAGTTCTCAAGAAGATTCTCTAAACTGGGTAGCTCGACTAGAAATGACCCAGAATTCCTA 5760

Qy       5787 CAGAGCCAAGGAGCCTATCCTGGCTCTCCGGAGGGCTTTACTAAGCCTCAACAAAAGACC 5846
             |||||||||||| ||||||||||||||||||||||||||||||||||||||||||||||||||
Db       5761 CAGAGCCAAGGACCCTATCCTGGCTCTCCGGAGGGCTTTACTAAGCCTCAACAAAAGACC 5820

Qy       5847 AGATTACAATGAAATGGTTGGAGAATGCTGGCTGCAGAGTGCCAGGGTAGCTAGAAAGGC 5906
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       5821 AGATTACAATGAAATGGTTGGAGAATGCTGGCTGCAGAGTGCCAGGGTAGCTAGAAAGGC 5880

Qy       5907 TGGTCACCACCAGACAGCCTACAATGCTCTCCTTAATGCAGGGGAATCACGACTCGCTGA 5966
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       5881 TGGTCACCACCAGACAGCCTACAATGCTCTCCTTAATGCAGGGGAATCACGACTCGCTGA 5940

Qy       5967 ACTGTACGTGGAAAGGGCAAAGTGGCTCTGGTCCAAGGGTGATGTTCACCAGGCACTAAT 6026
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       5941 ACTGTACGTGGAAAGGGCAAAGTGGCTCTGGTCCAAGGGTGATGTTCACCAGGCACTAAT 6000

Qy       6027 TGTTCTTCAAAAAGGTGTTGAATTATGTTTTCCTGAAAATGAAACCCCACCTGAGGGTAA 6086
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       6001 TGTTCTTCAAAAAGGTGTTGAATTATGTTTTCCTGAAAATGAAACCCCACCTGAGGGTAA 6060

Qy       6087 GAACATGTTAATCCATGGTCGAGCTATGCTACTAGTGGGCCGATTTATGGAAGAAACAGC 6146
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       6061 GAACATGTTAATCCATGGTCGAGCTATGCTACTAGTGGGCCGATTTATGGAAGAAACAGC 6120

Qy       6147 TAACTTTGAAAGCAATGCAATTATGAAAAAATATAAGGATGTGACCGCGTGCCTGCCAGA 6206
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Db       6121 TAACTTTGAAAGCAATGCAATTATGAAAAAATATAAGGATGTGACCGCGTGCCTGCCAGA 6180

Qy       6207 ATGGGAGGATGGGCATTTTTACCTTGCCAAGTACTATGACAAATTGATGCCCATGGTCAC 6266
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       6181 ATGGGAGGATGGGCATTTTTACCTTGCCAAGTACTATGACAAATTGATGCCCATGGTCAC 6240

Qy       6267 AGACAACAAAATGGAAAAGCAAGGTGATCTCATCCGGTATATAGTTCTTCATTTTGGCAG 6326
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Db       6241 AGACAACAAAATGGAAAAGCAAGGTGATCTCATCCGGTATATAGTTCTTCATTTTGGCAG 6300

Qy       6327 ATCTCTACAATATGGAAATCAGTTCATATATCAGTCAATGCCACGAATGTTAACTCTATG 6386
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Db       6301 ATCTCTACAATATGGAAATCAGTTCATATATCAGTCAATGCCACGAATGTTAACTCTATG 6360

Qy       6387 GCTTGATTATGGTACAAAGGCATATGAATGGGAAAAAGCTGGCCGCTCCGATCGTGTACA 6446
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       6361 GCTTGATTATGGTACAAAGGCATATGAATGGGAAAAAGCTGGCCGCTCCGATCGTGTACA 6420
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Qy       6447 AATGAGGAATGATTTGGGTAAAATAAACAAGGTTATCACAGAGCATACAAACTATTTAGC 6506
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Db       6421 AATGAGGAATGATTTGGGTAAAATAAACAAGGTTATCACAGAGCATACAAACTATTTAGC 6480

Qy       6507 TCCATATCAATTTTTGACTGCTTTTTCACAATTGATCTCTCGAATTTGTCATTCTCACGA 6566
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       6481 TCCATATCAATTTTTGACTGCTTTTTCACAATTGATCTCTCGAATTTGTCATTCTCACGA 6540

Qy       6567 TGAAGTTTTTGTTGTCTTGATGGAAATAATAGCCAAAGTATTTCTAGCCTATCCTCAACA 6626
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Db       6541 TGAAGTTTTTGTTGTCTTGATGGAAATAATAGCCAAAGTATTTCTAGCCTATCCTCAACA 6600

Qy       6627 AGCAATGTGGATGATGACAGCTGTGTCAAAGTCATCTTATCCCATGCGTGTGAACAGATG 6686
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Db       6601 AGCAATGTGGATGATGACAGCTGTGTCAAAGTCATCTTATCCCATGCGTGTGAACAGATG 6660

Qy       6687 CAAGGAAATCCTCAATAAAGCTATTCATATGAAAAAATCCTTAGAGAAGTTTGTTGGAGA 6746
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       6661 CAAGGAAATCCTCAATAAAGCTATTCATATGAAAAAATCCTTAGAGAAGTTTGTTGGAGA 6720

Qy       6747 TGCAACTCGCCTAACAGATAAGCTTCTAGAATTGTGCAATAAACCGGTTGATGGAAGTAG 6806
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Db       6721 TGCAACTCGCCTAACAGATAAGCTTCTAGAATTGTGCAATAAACCGGTTGATGGAAGTAG 6780

Qy       6807 TTCCACATTAAGCATGAGCACTCATTTTAAAATGCTTAAAAAGCTGGTAGAAGAAGCAAC 6866
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       6781 TTCCACATTAAGCATGAGCACTCATTTTAAAATGCTTAAAAAGCTGGTAGAAGAAGCAAC 6840

Qy       6867 ATTTAGTGAAATCCTCATTCCTCTACAATCAGTCATGATACCTACACTTCCATCAATTCT 6926
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       6841 ATTTAGTGAAATCCTCATTCCTCTACAATCAGTCATGATACCTACACTTCCATCAATTCT 6900

Qy       6927 GGGTACCCATGCTAACCATGCTAGCCATGAACCATTTCCTGGACATTGGGCCTATATTGC 6986
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       6901 GGGTACCCATGCTAACCATGCTAGCCATGAACCATTTCCTGGACATTGGGCCTATATTGC 6960

Qy       6987 AGGGTTTGATGATATGGTGGAAATTCTTGCTTCTCTTCAGAAACCAAAGAAGATTTCTTT 7046
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       6961 AGGGTTTGATGATATGGTGGAAATTCTTGCTTCTCTTCAGAAACCAAAGAAGATTTCTTT 7020

Qy       7047 AAAAGGCTCAGATGGAAAGTTCTACATCATGATGTGTAAGCCAAAAGATGACCTGAGAAA 7106
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Qy       7107 GGATTGTAGACTAATGGAATTCAATTCCTTGATTAATAAGTGCTTAAGAAAAGATGCAGA 7166
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       7081 GGATTGTAGACTAATGGAATTCAATTCCTTGATTAATAAGTGCTTAAGAAAAGATGCAGA 7140

Qy       7167 GTCTCGTAGAAGAGAACTTCATATTCGAACATATGCAGTTATTCCACTAAATGATGAATG 7226
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Db       7141 GTCTCGTAGAAGAGAACTTCATATTCGAACATATGCAGTTATTCCACTAAATGATGAATG 7200

Qy       7227 TGGGATTATTGAATGGGTGAACAACACTGCTGGTTTGAGACCTATTCTGACCAAACTATA 7286
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Db       7201 TGGGATTATTGAATGGGTGAACAACACTGCTGGTTTGAGACCTATTCTGACCAAACTATA 7260

Qy       7287 TAAAGAAAAGGGAGTGTATATGACAGGAAAAGAACTTCGCCAGTGTATGCTACCAAAGTC 7346
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Db       7261 TAAAGAAAAGGGAGTGTATATGACAGGAAAAGAACTTCGCCAGTGTATGCTACCAAAGTC 7320

Qy       7347 AGCAGCTTTATCTGAAAAACTCAAAGTATTCCGAGAATTTCTCCTGCCCAGGCATCCTCC 7406
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Db       7321 AGCAGCTTTATCTGAAAAACTCAAAGTATTCCGAGAATTTCTCCTGCCCAGGCATCCTCC 7380

Qy       7407 TATTTTTCATGAGTGGTTTCTGAGAACATTCCCTGATCCTACATCATGGTACAGTAGTAG 7466
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       7381 TATTTTTCATGAGTGGTTTCTGAGAACATTCCCTGATCCTACATCATGGTACAGTAGTAG 7440

Qy       7467 ATCAGCTTACTGCCGTTCCACTGCAGTAATGTCAATGGTTGGTTATATTCTGGGGCTTGG 7526
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Db       7441 ATCAGCTTACTGCCGTTCCACTGCAGTAATGTCAATGGTTGGTTATATTCTGGGGCTTGG 7500

Qy       7527 AGACCGTCATGGTGAAAATATTCTCTTTGATTCTTTGACTGGTGAATGCGTACATGTAGA 7586
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Db       7501 AGACCGTCATGGTGAAAATATTCTCTTTGATTCTTTGACTGGTGAATGCGTACATGTAGA 7560
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Qy       7587 TTTCAATTGTCTTTTCAATAAGGGAGAAACCTTTGAAGTTCCAGAAATTGTGCCATTTCG 7646
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       7561 TTTCAATTGTCTTTTCAATAAGGGAGAAACCTTTGAAGTTCCAGAAATTGTGCCATTTCG 7620

Qy       7647 CCTGACTCATAATATGGTTAATGGAATGGGTCCTATGGGAACAGAGGGTCTTTTTCGAAG 7706
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       7621 CCTGACTCATAATATGGTTAATGGAATGGGTCCTATGGGAACAGAGGGTCTTTTTCGAAG 7680

Qy       7707 AGCATGTGAAGTTACAATGAGGCTGATGCGTGATCAGCGAGAGCCTTTAATGAGTGTCTT 7766
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       7681 AGCATGTGAAGTTACAATGAGGCTGATGCGTGATCAGCGAGAGCCTTTAATGAGTGTCTT 7740

Qy       7767 AAAGACTTTTCTACATGATCCTCTTGTGGAATGGAGTAAACCAGTGAAAGGGCATTCCAA 7826
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       7741 AAAGACTTTTCTACATGATCCTCTTGTGGAATGGAGTAAACCAGTGAAAGGGCATTCCAA 7800

Qy       7827 AGCGCCACTGAATGAAACTGGAGAAGTTGTCAATGAAAAGGCCAAGACCCATGTTCTTGA 7886
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       7801 AGCGCCACTGAATGAAACTGGAGAAGTTGTCAATGAAAAGGCCAAGACCCATGTTCTTGA 7860

Qy       7887 CATTGAGCAGCGACTACAAGGTGTAATCAAGACTCGAAATAGAGTGACAGGACTGCCGTT 7946
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       7861 CATTGAGCAGCGACTACAAGGTGTAATCAAGACTCGAAATAGAGTGACAGGACTGCCGTT 7920

Qy       7947 ATCTATTGAAGGACATGTGCATTACCTTATACAAGAAGCTACTGATGAAAACTTACTATG 8006
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Db       7921 ATCTATTGAAGGACATGTGCATTACCTTATACAAGAAGCTACTGATGAAAACTTACTATG 7980

Qy       8007 CCAGATGTATCTTGGTTGGACTCCATATATGTGAAATGAAATTATGTAAAAGAATATGTT 8066
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       7981 CCAGATGTATCTTGGTTGGACTCCATATATGTGAAATGAAATTATGTAAAAGAATATGTT 8040

Qy       8067 AATAATCTAAAAGTAATGCATTTGGTATGAATCTGTGGTTGTATCTGTTCAATTCTAAAG 8126
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       8041 AATAATCTAAAAGTAATGCATTTGGTATGAATCTGTGGTTGTATCTGTTCAATTCTAAAG 8100

Qy       8127 TACAACATAAATTTACGTTCTCAGCAACTGTTATTTCTCTCTGATCATTAATTATATGTA 8186
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Db       8101 TACAACATAAATTTACGTTCTCAGCAACTGTTATTTCTCTCTGATCATTAATTATATGTA 8160

Qy       8187 AAATAATATACATTCAGTTATTAAGAAATAAACTGCTTTCTTAATAAAAAAAAAAAAAAA 8246
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       8161 AAATAATATACATTCAGTTATTAAGAAATAAACTGCTTTCTTAATAAAAAAAAAAAAAAA 8220

Qy       8247 AAAAAAAAAAAAAAAAAAA 8265
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Db       8221 AAAAAAAAAAAAAAAAAAA 8239
<!--EndFragment-->
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Exhibit C

<!--StartFragment-->RESULT 1
US-10-300-453B-38
; Sequence 38, Application US/10300453B
; Patent No. 7101985
; GENERAL INFORMATION:
; APPLICANT: ELLEDGE, STEPHEN J.
; APPLICANT: CORTEZ, DAVID K.
; APPLICANT: ZOU, LEE
; TITLE OF INVENTION: METHODS AND COMPOSITIONS IN CHECKPOINT SIGNALING
; FILE REFERENCE: P02339US1
; CURRENT APPLICATION NUMBER: US/10/300,453B
; CURRENT FILING DATE: 2002-11-20
; PRIOR APPLICATION NUMBER: 60/331,821
; PRIOR FILING DATE: 2001-11-20
; NUMBER OF SEQ ID NOS: 50
; SOFTWARE: PatentIn Ver. 2.1
; SEQ ID NO 38
; LENGTH: 8265
; TYPE: DNA
; ORGANISM: Homo sapiens
US-10-300-453B-38

Query Match 100.0%; Score 8265; DB 5; Length 8265;
Best Local Similarity 100.0%; Pred. No. 0;
Matches 8265; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

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Qy          1 GCCTCCACACGGCTCCGTCGGGCGCCGCGCTCTTCCGGCAGCGGTACGTTTGGAGACGCC 60
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db          1 GCCTCCACACGGCTCCGTCGGGCGCCGCGCTCTTCCGGCAGCGGTACGTTTGGAGACGCC 60

Qy         61 GGGAACCCGCGTTGGCGTGGTTGACTAGTGCCTCGCAGCCTCAGCATGGGGGAACATGGC 120
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db         61 GGGAACCCGCGTTGGCGTGGTTGACTAGTGCCTCGCAGCCTCAGCATGGGGGAACATGGC 120

Qy        121 CTGGAGCTGGCTTCCATGATCCCCGCCCTGCGGGAGCTGGGCAGTGCCACACCAGAGGAA 180
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        121 CTGGAGCTGGCTTCCATGATCCCCGCCCTGCGGGAGCTGGGCAGTGCCACACCAGAGGAA 180

Qy        181 TATAATACAGTTGTACAGAAGCCAAGACAAATTCTGTGTCAATTCATTGACCGGATACTT 240
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        181 TATAATACAGTTGTACAGAAGCCAAGACAAATTCTGTGTCAATTCATTGACCGGATACTT 240

Qy        241 ACAGATGTAAATGTTGTTGCTGTAGAACTTGTAAAGAAAACTGACTCTCAGCCAACCTCC 300
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Db        241 ACAGATGTAAATGTTGTTGCTGTAGAACTTGTAAAGAAAACTGACTCTCAGCCAACCTCC 300

Qy        301 GTGATGTTGCTTGATTTCATCCAGCATATCATGAAATCCTCCCCACTTATGTTTGTAAAT 360
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Db        301 GTGATGTTGCTTGATTTCATCCAGCATATCATGAAATCCTCCCCACTTATGTTTGTAAAT 360

Qy        361 GTGAGTGGAAGCCATGAGCGCAAAGGCAGTTGTATTGAATTCAGTAATTGGATCATAACG 420
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Db        361 GTGAGTGGAAGCCATGAGCGCAAAGGCAGTTGTATTGAATTCAGTAATTGGATCATAACG 420

Qy        421 AGACTTCTGCGGATTGCAGCAACTCCCTCCTGTCATTTGTTACACAAGAAAATCTGTGAA 480
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Db        421 AGACTTCTGCGGATTGCAGCAACTCCCTCCTGTCATTTGTTACACAAGAAAATCTGTGAA 480

Qy        481 GTCATCTGTTCATTATTATTTCTTTTTAAAAGCAAGAGTCCTGCTATTTTTGGGGTACTC 540
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Qy        541 ACAAAAGAATTATTACAACTTTTTGAAGACTTGGTTTACCTCCATAGAAGAAATGTGATG 600
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Db        541 ACAAAAGAATTATTACAACTTTTTGAAGACTTGGTTTACCTCCATAGAAGAAATGTGATG 600

Qy        601 GGTCATGCTGTGGAATGGCCAGTGGTCATGAGCCGATTTTTAAGTCAATTAGATGAACAC 660
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Db        601 GGTCATGCTGTGGAATGGCCAGTGGTCATGAGCCGATTTTTAAGTCAATTAGATGAACAC 660

Qy        661 ATGGGATATTTACAATCAGCTCCTTTGCAGTTGATGAGTATGCAAAATTTAGAATTTATT 720
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Db        661 ATGGGATATTTACAATCAGCTCCTTTGCAGTTGATGAGTATGCAAAATTTAGAATTTATT 720

Qy        721 GAAGTCACTTTATTAATGGTTCTTACTCGTATTATTGCAATTGTGTTTTTTAGAAGGCAA 780
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
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Db        721 GAAGTCACTTTATTAATGGTTCTTACTCGTATTATTGCAATTGTGTTTTTTAGAAGGCAA 780

Qy        781 GAACTCTTACTTTGGCAGATAGGTTGTGTTCTGCTAGAGTATGGTAGTCCAAAAATTAAA 840
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        781 GAACTCTTACTTTGGCAGATAGGTTGTGTTCTGCTAGAGTATGGTAGTCCAAAAATTAAA 840

Qy        841 TCCCTAGCAATTAGCTTTTTAACAGAACTTTTTCAGCTTGGAGGACTACCAGCACAACCA 900
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        841 TCCCTAGCAATTAGCTTTTTAACAGAACTTTTTCAGCTTGGAGGACTACCAGCACAACCA 900

Qy        901 GCTAGCACTTTTTTTCAGCTCATTTTTGGAATTATTAAAACACCTTGTAGAAATGGATACT 960
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Db        901 GCTAGCACTTTTTTTCAGCTCATTTTTGGAATTATTAAAACACCTTGTAGAAATGGATACT 960

Qy        961 GACCAATTGAAACTCTATGAAGAGCCATTATCAAAGCTGATAAAGACACTATTTCCCTTT 1020
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        961 GACCAATTGAAACTCTATGAAGAGCCATTATCAAAGCTGATAAAGACACTATTTCCCTTT 1020

Qy       1021 GAAGCAGAAGCTTATAGAAATATTGAACCTGTCTATTTAAATATGCTGCTGGAAAAACTC 1080
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Db       1021 GAAGCAGAAGCTTATAGAAATATTGAACCTGTCTATTTAAATATGCTGCTGGAAAAACTC 1080

Qy       1081 TGTGTCATGTTTGAAGACGGTGTGCTCATGCGGCTTAAGTCTGATTTGCTAAAAGCAGCT 1140
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       1081 TGTGTCATGTTTGAAGACGGTGTGCTCATGCGGCTTAAGTCTGATTTGCTAAAAGCAGCT 1140

Qy       1141 TTGTGCCATTTACTGCAGTATTTCCTTAAATTTGTGCCAGCTGGGTATGAATCTGCTTTA 1200
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       1141 TTGTGCCATTTACTGCAGTATTTCCTTAAATTTGTGCCAGCTGGGTATGAATCTGCTTTA 1200

Qy       1201 CAAGTCAGGAAGGTCTATGTGAGAAATATTTGTAAAGCTCTTTTGGATGTGCTTGGAATT 1260
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       1201 CAAGTCAGGAAGGTCTATGTGAGAAATATTTGTAAAGCTCTTTTGGATGTGCTTGGAATT 1260

Qy       1261 GAGGTAGATGCAGAGTACTTGTTGGGCCCACTTTATGCAGCTTTGAAAATGGAAAGTATG 1320
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       1261 GAGGTAGATGCAGAGTACTTGTTGGGCCCACTTTATGCAGCTTTGAAAATGGAAAGTATG 1320

Qy       1321 GAAATCATTGAGGAGATTCAATGCCAAACTCAACAGGAAAACCTCAGCAGTAATAGTGAT 1380
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       1321 GAAATCATTGAGGAGATTCAATGCCAAACTCAACAGGAAAACCTCAGCAGTAATAGTGAT 1380

Qy       1381 GGAATATCACCCAAAAGGCGTCGTCTCAGCTCGTCTCTAAACCCTTCTAAAAGAGCACCA 1440
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       1381 GGAATATCACCCAAAAGGCGTCGTCTCAGCTCGTCTCTAAACCCTTCTAAAAGAGCACCA 1440

Qy       1441 AAACAGACTGAGGAAATTAAACATGTGGACATGAACCAAAAGAGCATATTATGGAGTGCA 1500
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       1441 AAACAGACTGAGGAAATTAAACATGTGGACATGAACCAAAAGAGCATATTATGGAGTGCA 1500

Qy       1501 CTGAAACAGAAAGCTGAATCCCTTCAGATTTCCCTTGAATACAGTGGCCTAAAGAATCCT 1560
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       1501 CTGAAACAGAAAGCTGAATCCCTTCAGATTTCCCTTGAATACAGTGGCCTAAAGAATCCT 1560

Qy       1561 GTTATTGAGATGTTAGAAGGAATTGCTGTTGTCTTACAACTGACTGCTCTGTGTACTGTT 1620
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       1561 GTTATTGAGATGTTAGAAGGAATTGCTGTTGTCTTACAACTGACTGCTCTGTGTACTGTT 1620

Qy       1621 CATTGTTCTCATCAAAACATGAACTGCCGTACTTTCAAGGACTGTCAACATAAATCCAAG 1680
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       1621 CATTGTTCTCATCAAAACATGAACTGCCGTACTTTCAAGGACTGTCAACATAAATCCAAG 1680

Qy       1681 AAGAAACCTTCTGTAGTGATAACTTGGATGTCATTGGATTTTTACACAAAAGTGCTTAAG 1740
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       1681 AAGAAACCTTCTGTAGTGATAACTTGGATGTCATTGGATTTTTACACAAAAGTGCTTAAG 1740

Qy       1741 AGCTGTAGAAGTTTGTTAGAATCTGTTCAGAAACTGGACCTGGAGGCAACCATTGATAAG 1800
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       1741 AGCTGTAGAAGTTTGTTAGAATCTGTTCAGAAACTGGACCTGGAGGCAACCATTGATAAG 1800

Qy       1801 GTGGTGAAAATTTATGATGCTTTGATTTATATGCAAGTAAACAGTTCATTTGAAGATCAT 1860
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       1801 GTGGTGAAAATTTATGATGCTTTGATTTATATGCAAGTAAACAGTTCATTTGAAGATCAT 1860

Qy       1861 ATCCTGGAAGATTTATGTGGTATGCTCTCACTTCCATGGATTTATTCCCATTCTGATGAT 1920
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
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Db      1861 ATCCTGGAAGATTTATGTGGTATGCTCTCACTTCCATGGATTTATTCCCATTCTGATGAT 1920

Qy      1921 GGCTGTTTAAAGTTGACCACATTTGCCGCTAATCTTCTAACATTAAGCTGTAGGATTTCA 1980
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      1921 GGCTGTTTAAAGTTGACCACATTTGCCGCTAATCTTCTAACATTAAGCTGTAGGATTTCA 1980

Qy      1981 GATAGCTATTCACCACAGGCACAATCACGATGTGTGTTTCTTCTGACTCTGTTTCCAAGA 2040
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      1981 GATAGCTATTCACCACAGGCACAATCACGATGTGTGTTTCTTCTGACTCTGTTTCCAAGA 2040

Qy      2041 AGAATATTCCTTGAGTGGAGAACAGCAGTTTACAACTGGGCCCTGCAGAGCTCCCATGAA 2100
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      2041 AGAATATTCCTTGAGTGGAGAACAGCAGTTTACAACTGGGCCCTGCAGAGCTCCCATGAA 2100

Qy      2101 GTAATCCGGGGCTAGTTGTGTTAGTGGATTTTTTATCTTATTGCAGCAGCAGAATTCTTGT 2160
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      2101 GTAATCCGGGGCTAGTTGTGTTAGTGGATTTTTTATCTTATTGCAGCAGCAGAATTCTTGT 2160

Qy      2161 AACAGAGTTCCCAAGATTCTTATAGATAAAGTCAAAGATGATTCTGACATTGTCAAGAAA 2220
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      2161 AACAGAGTTCCCAAGATTCTTATAGATAAAGTCAAAGATGATTCTGACATTGTCAAGAAA 2220

Qy      2221 GAATTTGCTTCTATACTTGGTCAACTTGTCTGTACTCTTCACGGCATGTTTTATCTGACA 2280
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      2221 GAATTTGCTTCTATACTTGGTCAACTTGTCTGTACTCTTCACGGCATGTTTTATCTGACA 2280

Qy      2281 AGTTCTTTAACAGAACCTTTCTCTGAACACGGACATGTGGACCTCTTCTGTAGGAACTTG 2340
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      2281 AGTTCTTTAACAGAACCTTTCTCTGAACACGGACATGTGGACCTCTTCTGTAGGAACTTG 2340

Qy      2341 AAAGCCACTTCTCAACATGAATGTTCATCTTCTCAACTAAAAGCTTCTGTCTGCAAGCCA 2400
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      2341 AAAGCCACTTCTCAACATGAATGTTCATCTTCTCAACTAAAAGCTTCTGTCTGCAAGCCA 2400

Qy      2401 TTCCTTTTCCTACTGAAAAAAAAAATACCTAGTCCAGTAAAACTTGCTTTCATAGATAAT 2460
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      2401 TTCCTTTTCCTACTGAAAAAAAAAATACCTAGTCCAGTAAAACTTGCTTTCATAGATAAT 2460

Qy      2461 CTACATCATCTTTGTAAGCATCTTGATTTTAGAGAAGATGAAACAGATGTAAAAGCAGTT 2520
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      2461 CTACATCATCTTTGTAAGCATCTTGATTTTAGAGAAGATGAAACAGATGTAAAAGCAGTT 2520

Qy      2521 CTTGGAACTTTATTAAATTTAATGGAAGATCCAGACAAAGATGTTAGAGTGGCTTTTAGT 2580
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      2521 CTTGGAACTTTATTAAATTTAATGGAAGATCCAGACAAAGATGTTAGAGTGGCTTTTAGT 2580

Qy      2581 GGAAATATCAAGCACATATTGGAATCCTTGGACTCTGAAGATGGATTTATAAAGGAGCTT 2640
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      2581 GGAAATATCAAGCACATATTGGAATCCTTGGACTCTGAAGATGGATTTATAAAGGAGCTT 2640

Qy      2641 TTTGTCTTAAGAATGAAGGAAGCATATACACATGCCCAAATATCAAGAAATAATGAGCTG 2700
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      2641 TTTGTCTTAAGAATGAAGGAAGCATATACACATGCCCAAATATCAAGAAATAATGAGCTG 2700

Qy      2701 AAGGATACCTTGATTCTTACAACAGGGGATATTGGAAGGGCCGCAAAAGGAGATTTGGTA 2760
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      2701 AAGGATACCTTGATTCTTACAACAGGGGATATTGGAAGGGCCGCAAAAGGAGATTTGGTA 2760

Qy      2761 CCATTTGCACTCTTACACTTATTGCATTGTTTGTTATCCAAGTCAGCATCTGTCTCTGGA 2820
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      2761 CCATTTGCACTCTTACACTTATTGCATTGTTTGTTATCCAAGTCAGCATCTGTCTCTGGA 2820

Qy      2821 GCAGCATACACAGAAATTAGAGCTCTGGTTGCAGCTAAAAGTGTTAAACTGCAAAGTTTT 2880
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      2821 GCAGCATACACAGAAATTAGAGCTCTGGTTGCAGCTAAAAGTGTTAAACTGCAAAGTTTT 2880

Qy      2881 TTCAGCCAGTATAAGAAACCCATCTGTCAGTTTTTGGTAGAATCCCTTCACTCTAGTCAG 2940
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      2881 TTCAGCCAGTATAAGAAACCCATCTGTCAGTTTTTGGTAGAATCCCTTCACTCTAGTCAG 2940

Qy      2941 ATGACAGCACTTCCGAATACTCCATGCCAGAATGCTGACGTGCGAAAACAAGATGTGGCT 3000
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      2941 ATGACAGCACTTCCGAATACTCCATGCCAGAATGCTGACGTGCGAAAACAAGATGTGGCT 3000

Qy      3001 CACCAGAGAGAAATGGCTTTAAATACGTTGTCTGAAATTGCCAACGTTTTCGACTTTCCT 3060
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
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Db      3001 CACCAGAGAGAAATGGCTTTAAATACGTTGTCTGAAATTGCCAACGTTTTCGACTTTCCT 3060

Qy      3061 GATCTTAATCGTTTTCTTACTAGGACATTACAAGTTCTACTACCTGATCTTGCTGCCAAA 3120
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      3061 GATCTTAATCGTTTTCTTACTAGGACATTACAAGTTCTACTACCTGATCTTGCTGCCAAA 3120

Qy      3121 GCAAGCCCTGCAGCTTCTGCTCTCATTCGAACTTTAGGAAAACAATTAAATGTCAATCGT 3180
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      3121 GCAAGCCCTGCAGCTTCTGCTCTCATTCGAACTTTAGGAAAACAATTAAATGTCAATCGT 3180

Qy      3181 AGAGAGATTTTAATAAACAACTTCAAATATATTTTTTCTCATTTGGTCTGTTCTTGTTCC 3240
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      3181 AGAGAGATTTTAATAAACAACTTCAAATATATTTTTTCTCATTTGGTCTGTTCTTGTTCC 3240

Qy      3241 AAAGATGAATTAGAACGTGCCCTTCATTATCTGAAGAATGAAACAGAAATTGAACTGGGG 3300
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      3241 AAAGATGAATTAGAACGTGCCCTTCATTATCTGAAGAATGAAACAGAAATTGAACTGGGG 3300

Qy      3301 AGCCTGTTGAGACAAGATTTCCAAGGATTGCATAATGAATTATTGCTGCGTATTGGAGAA 3360
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      3301 AGCCTGTTGAGACAAGATTTCCAAGGATTGCATAATGAATTATTGCTGCGTATTGGAGAA 3360

Qy      3361 CACTATCAACAGGTTTTTAATGGTTTGTCAATACTTGCCTCATTTGCATCCAGTGATGAT 3420
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      3361 CACTATCAACAGGTTTTTAATGGTTTGTCAATACTTGCCTCATTTGCATCCAGTGATGAT 3420

Qy      3421 CCATATCAGGGCCCGAGAGATATCATATCACCTGAACTGATGGCTGATTATTTACAACCC 3480
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      3421 CCATATCAGGGCCCGAGAGATATCATATCACCTGAACTGATGGCTGATTATTTACAACCC 3480

Qy      3481 AAATTGTTGGGCATTTTGGCTTTTTTTAACATGCAGTTACTGAGCTCTAGTGTTGGCATT 3540
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      3481 AAATTGTTGGGCATTTTGGCTTTTTTTAACATGCAGTTACTGAGCTCTAGTGTTGGCATT 3540

Qy      3541 GAAGATAAGAAAATGGCCTTGAACAGTTTGATGTCTTTGATGAAGTTAATGGGACCCAAA 3600
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      3541 GAAGATAAGAAAATGGCCTTGAACAGTTTGATGTCTTTGATGAAGTTAATGGGACCCAAA 3600

Qy      3601 CATGTCAGTTCTGTGAGGGTGAAGATGATGACCACACTGAGAACTGGCCTTCGATTCAAG 3660
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      3601 CATGTCAGTTCTGTGAGGGTGAAGATGATGACCACACTGAGAACTGGCCTTCGATTCAAG 3660

Qy      3661 GATGATTTTCCTGAATTGTGTTGCAGAGCTTGGGACTGCTTTGTTCGCTGCCTGGATCAT 3720
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      3661 GATGATTTTCCTGAATTGTGTTGCAGAGCTTGGGACTGCTTTGTTCGCTGCCTGGATCAT 3720

Qy      3721 GCTTGTCTGGGCTCCCTTCTCAGTCATGTAATAGTAGCTTTGTTACCTCTTATACACATC 3780
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      3721 GCTTGTCTGGGCTCCCTTCTCAGTCATGTAATAGTAGCTTTGTTACCTCTTATACACATC 3780

Qy      3781 CAGCCTAAAGAAACTGCAGCTATCTTCCACTACCTCATAATTGAAAACAGGGATGCTGTG 3840
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      3781 CAGCCTAAAGAAACTGCAGCTATCTTCCACTACCTCATAATTGAAAACAGGGATGCTGTG 3840

Qy      3841 CAAGATTTTCTTCATGAAATATATTTTTTACCTGATCATCCAGAATTAAAAAAGATAAAA 3900
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      3841 CAAGATTTTCTTCATGAAATATATTTTTTACCTGATCATCCAGAATTAAAAAAGATAAAA 3900

Qy      3901 GCCGTTCTCCAGGAATACAGAAAGGAGACCTCTGAGAGCACTGATCTTCAGACAACTCTT 3960
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      3901 GCCGTTCTCCAGGAATACAGAAAGGAGACCTCTGAGAGCACTGATCTTCAGACAACTCTT 3960

Qy      3961 CAGCTCTCTATGAAGGCCATTCAACATGAAAATGTCGATGTTCGTATTCATGCTCTTACA 4020
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      3961 CAGCTCTCTATGAAGGCCATTCAACATGAAAATGTCGATGTTCGTATTCATGCTCTTACA 4020

Qy      4021 AGCTTGAAGGAAACCTTGTATAAAAATCAGGAAAAACTGATAAAGTATGCAACAGACAGT 4080
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      4021 AGCTTGAAGGAAACCTTGTATAAAAATCAGGAAAAACTGATAAAGTATGCAACAGACAGT 4080

Qy      4081 GAAACAGTAGAACCTATTATCTCACAGTTGGTGACAGTGCTTTTGAAAGGTTGCCAAGAT 4140
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      4081 GAAACAGTAGAACCTATTATCTCACAGTTGGTGACAGTGCTTTTGAAAGGTTGCCAAGAT 4140

Qy      4141 GCAAACTCTCAAGCTCGGTTGCTCTGTGGGGAATGTTTAGGGGAATTGGGGGCGATAGAT 4200
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
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Db      4141 GCAAACTCTCAAGCTCGGTTGCTCTGTGGGGAATGTTTAGGGGAATTGGGGGCGATAGAT 4200

Qy      4201 CCAGGTCGATTAGATTTCTCAACAACTGAAACTCAAGGAAAAGATTTTACATTTGTGACT 4260
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      4201 CCAGGTCGATTAGATTTCTCAACAACTGAAACTCAAGGAAAAGATTTTACATTTGTGACT 4260

Qy      4261 GGAGTAGAAGATTCAAGCTTTGCCTATGGATTATTGATGGAGCTAACAAGAGCTTACCTT 4320
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      4261 GGAGTAGAAGATTCAAGCTTTGCCTATGGATTATTGATGGAGCTAACAAGAGCTTACCTT 4320

Qy      4321 GCGTATGCTGATAATAGCCGAGCTCAAGATTCAGCTGCCTATGCCATTCAGGAGTTGCTT 4380
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      4321 GCGTATGCTGATAATAGCCGAGCTCAAGATTCAGCTGCCTATGCCATTCAGGAGTTGCTT 4380

Qy      4381 TCTATTTATGACTGTAGAGAGATGGAGACCAACGGCCCAGGTCACCAATTGTGGAGGAGA 4440
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      4381 TCTATTTATGACTGTAGAGAGATGGAGACCAACGGCCCAGGTCACCAATTGTGGAGGAGA 4440

Qy      4441 TTTCCTGAGCATGTTCGGGAAATACTAGAACCTCATCTAAATACCAGATACAAGAGTTCT 4500
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      4441 TTTCCTGAGCATGTTCGGGAAATACTAGAACCTCATCTAAATACCAGATACAAGAGTTCT 4500

Qy      4501 CAGAAGTCAACCGATTGGTCTGGAGTAAAGAAGCCAATTTACTTAAGTAAATTGGGTAGT 4560
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      4501 CAGAAGTCAACCGATTGGTCTGGAGTAAAGAAGCCAATTTACTTAAGTAAATTGGGTAGT 4560

Qy      4561 AACTTTGCAGAATGGTCAGCATCTTGGGCAGGTTATCTTATTACAAAGGTTCGACATGAT 4620
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      4561 AACTTTGCAGAATGGTCAGCATCTTGGGCAGGTTATCTTATTACAAAGGTTCGACATGAT 4620

Qy      4621 CTTGCCAGTAAAATTTTCACCTGCTGTAGCATTATGATGAAGCATGATTTCAAAGTGACC 4680
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      4621 CTTGCCAGTAAAATTTTCACCTGCTGTAGCATTATGATGAAGCATGATTTCAAAGTGACC 4680

Qy      4681 ATCTATCTTCTTCCACATATTCTGGTGTATGTCTTACTGGGTTGTAATCAAGAAGATCAG 4740
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      4681 ATCTATCTTCTTCCACATATTCTGGTGTATGTCTTACTGGGTTGTAATCAAGAAGATCAG 4740

Qy      4741 CAGGAGGTTTATGCAGAAATTATGGCAGTTCTAAAGCATGACGATCAGCATACCATAAAT 4800
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      4741 CAGGAGGTTTATGCAGAAATTATGGCAGTTCTAAAGCATGACGATCAGCATACCATAAAT 4800

Qy      4801 ACCCAAGACATTGCATCTGATCTGTGTCAACTCAGTACACAGACTGTGTTCTCCATGCTT 4860
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      4801 ACCCAAGACATTGCATCTGATCTGTGTCAACTCAGTACACAGACTGTGTTCTCCATGCTT 4860

Qy      4861 GACCATCTCACACAGTGGGCAAGGCACAAATTTCAGGCACTGAAAGCTGAGAAATGTCCA 4920
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      4861 GACCATCTCACACAGTGGGCAAGGCACAAATTTCAGGCACTGAAAGCTGAGAAATGTCCA 4920

Qy      4921 CACAGCAAATCAAACAGAAATAAGGTAGACTCAATGGTATCTACTGTGGATTATGAAGAC 4980
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      4921 CACAGCAAATCAAACAGAAATAAGGTAGACTCAATGGTATCTACTGTGGATTATGAAGAC 4980

Qy      4981 TATCAGAGTGTAACCCGTTTTCTAGACCTCATACCCCAGGATACTCTGGCAGTAGCTTCC 5040
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      4981 TATCAGAGTGTAACCCGTTTTCTAGACCTCATACCCCAGGATACTCTGGCAGTAGCTTCC 5040

Qy      5041 TTTCGCTCCAAAGCATACACACGAGCTGTAATGCACTTTGAATCATTTATTACAGAAAAG 5100
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      5041 TTTCGCTCCAAAGCATACACACGAGCTGTAATGCACTTTGAATCATTTATTACAGAAAAG 5100

Qy      5101 AAGCAAAATATTCAGGAACATCTTGGATTTTTACAGAAATTGTATGCTGCTATGCATGAA 5160
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      5101 AAGCAAAATATTCAGGAACATCTTGGATTTTTACAGAAATTGTATGCTGCTATGCATGAA 5160

Qy      5161 CCTGATGGAGTGGCCGGAGTCAGTGCAATTAGAAAGGCAGAACCATCTCTAAAAGAACAG 5220
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      5161 CCTGATGGAGTGGCCGGAGTCAGTGCAATTAGAAAGGCAGAACCATCTCTAAAAGAACAG 5220

Qy      5221 ATCCTTGAACATGAAAGCCTTGGCTTGCTGAGGGATGCCACTGCTTGTTATGACAGGGCT 5280
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      5221 ATCCTTGAACATGAAAGCCTTGGCTTGCTGAGGGATGCCACTGCTTGTTATGACAGGGCT 5280

Qy      5281 ATTCAGCTAGAACCAGACCAGATCATTCATTATCATGGTGTAGTAAAGTCCATGTTAGGT 5340
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
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Db      5281 ATTCAGCTAGAACCAGACCAGATCATTCATTATCATGGTGTAGTAAAGTCCATGTTAGGT 5340

Qy      5341 CTTGGTCAGCTGTCTACTGTTATCACTCAGGTGAATGGAGTGCATGCTAACAGGTCCGAG 5400
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      5341 CTTGGTCAGCTGTCTACTGTTATCACTCAGGTGAATGGAGTGCATGCTAACAGGTCCGAG 5400

Qy      5401 TGGACAGATGAATTAAACACGTACAGAGTGGAAGCAGCTTGGAAATTGTCACAGTGGGAT 5460
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      5401 TGGACAGATGAATTAAACACGTACAGAGTGGAAGCAGCTTGGAAATTGTCACAGTGGGAT 5460

Qy      5461 TTGGTGGAAAACTATTTGGCAGCAGATGGAAAATCTACAACATGGAGTGTCAGACTGGGA 5520
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      5461 TTGGTGGAAAACTATTTGGCAGCAGATGGAAAATCTACAACATGGAGTGTCAGACTGGGA 5520

Qy      5521 CAGCTATTATTATCAGCCAAAAAAAGAGATATCACAGCTTTTTATGACTCACTGAAACTA 5580
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      5521 CAGCTATTATTATCAGCCAAAAAAAGAGATATCACAGCTTTTTATGACTCACTGAAACTA 5580

Qy      5581 GTGAGAGCAGAACAAATTGTACCTCTTTCAGCTGCAAGCTTTGAAAGAGGCTCCTACCAA 5640
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      5581 GTGAGAGCAGAACAAATTGTACCTCTTTCAGCTGCAAGCTTTGAAAGAGGCTCCTACCAA 5640

Qy      5641 CGAGGATATGAATATATTGTGAGATTGCACATGTTATGTGAGTTGGAGCATAGCATCAAA 5700
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      5641 CGAGGATATGAATATATTGTGAGATTGCACATGTTATGTGAGTTGGAGCATAGCATCAAA 5700

Qy      5701 CCACTTTTCCAGCATTCTCCAGGTGACAGTTCTCAAGAAGATTCTCTAAACTGGGTAGCT 5760
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      5701 CCACTTTTCCAGCATTCTCCAGGTGACAGTTCTCAAGAAGATTCTCTAAACTGGGTAGCT 5760

Qy      5761 CGACTAGAAATGACCCAGAATTCCTACAGAGCCAAGGAGCCTATCCTGGCTCTCCGGAGG 5820
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      5761 CGACTAGAAATGACCCAGAATTCCTACAGAGCCAAGGAGCCTATCCTGGCTCTCCGGAGG 5820

Qy      5821 GCTTTACTAAGCCTCAACAAAAGACCAGATTACAATGAAATGGTTGGAGAATGCTGGCTG 5880
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      5821 GCTTTACTAAGCCTCAACAAAAGACCAGATTACAATGAAATGGTTGGAGAATGCTGGCTG 5880

Qy      5881 CAGAGTGCCAGGGTAGCTAGAAAGGCTGGTCACCACCAGACAGCCTACAATGCTCTCCTT 5940
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      5881 CAGAGTGCCAGGGTAGCTAGAAAGGCTGGTCACCACCAGACAGCCTACAATGCTCTCCTT 5940

Qy      5941 AATGCAGGGGAATCACGACTCGCTGAACTGTACGTGGAAAGGGCAAAGTGGCTCTGGTCC 6000
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      5941 AATGCAGGGGAATCACGACTCGCTGAACTGTACGTGGAAAGGGCAAAGTGGCTCTGGTCC 6000

Qy      6001 AAGGGTGATGTTCACCAGGCACTAATTGTTCTTCAAAAAGGTGTTGAATTATGTTTTCCT 6060
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      6001 AAGGGTGATGTTCACCAGGCACTAATTGTTCTTCAAAAAGGTGTTGAATTATGTTTTCCT 6060

Qy      6061 GAAAATGAAACCCCACCTGAGGGTAAGAACATGTTAATCCATGGTCGAGCTATGCTACTA 6120
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      6061 GAAAATGAAACCCCACCTGAGGGTAAGAACATGTTAATCCATGGTCGAGCTATGCTACTA 6120

Qy      6121 GTGGGCCGATTTATGGAAGAAACAGCTAACTTTGAAAGCAATGCAATTATGAAAAAATAT 6180
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Db      6121 GTGGGCCGATTTATGGAAGAAACAGCTAACTTTGAAAGCAATGCAATTATGAAAAAATAT 6180

Qy      6181 AAGGATGTGACCGCGTGCCTGCCAGAATGGGAGGATGGGCATTTTTACCTTGCCAAGTAC 6240
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      6181 AAGGATGTGACCGCGTGCCTGCCAGAATGGGAGGATGGGCATTTTTACCTTGCCAAGTAC 6240

Qy      6241 TATGACAAATTGATGCCCATGGTCACAGACAACAAAATGGAAAAGCAAGGTGATCTCATC 6300
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      6241 TATGACAAATTGATGCCCATGGTCACAGACAACAAAATGGAAAAGCAAGGTGATCTCATC 6300

Qy      6301 CGGTATATAGTTCTTCATTTTGGCAGATCTCTACAATATGGAAATCAGTTCATATATCAG 6360
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Db      6301 CGGTATATAGTTCTTCATTTTGGCAGATCTCTACAATATGGAAATCAGTTCATATATCAG 6360

Qy      6361 TCAATGCCACGAATGTTAACTCTATGGCTTGATTATGGTACAAAGGCATATGAATGGGAA 6420
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Db      6361 TCAATGCCACGAATGTTAACTCTATGGCTTGATTATGGTACAAAGGCATATGAATGGGAA 6420

Qy      6421 AAAGCTGGCCGCTCCGATCGTGTACAAATGAGGAATGATTTGGGTAAAATAAACAAGGTT 6480
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Db      6421 AAAGCTGGCCGCTCCGATCGTGTACAAATGAGGAATGATTTGGGTAAAATAAACAAGGTT 6480

Qy      6481 ATCACAGAGCATACAAACTATTTAGCTCCATATCAATTTTTGACTGCTTTTTCACAATTG 6540
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Db      6481 ATCACAGAGCATACAAACTATTTAGCTCCATATCAATTTTTGACTGCTTTTTCACAATTG 6540

Qy      6541 ATCTCTCGAATTTGTCATTCTCACGATGAAGTTTTTGTTGTCTTGATGGAAATAATAGCC 6600
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Db      6541 ATCTCTCGAATTTGTCATTCTCACGATGAAGTTTTTGTTGTCTTGATGGAAATAATAGCC 6600

Qy      6601 AAAGTATTTCTAGCCTATCCTCAACAAGCAATGTGGATGATGACAGCTGTGTCAAAGTCA 6660
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Db      6601 AAAGTATTTCTAGCCTATCCTCAACAAGCAATGTGGATGATGACAGCTGTGTCAAAGTCA 6660

Qy      6661 TCTTATCCCATGCGTGTGAACAGATGCAAGGAAATCCTCAATAAAGCTATTCATATGAAA 6720
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Db      6661 TCTTATCCCATGCGTGTGAACAGATGCAAGGAAATCCTCAATAAAGCTATTCATATGAAA 6720

Qy      6721 AAATCCTTAGAGAAGTTTGTTGGAGATGCAACTCGCCTAACAGATAAGCTTCTAGAATTG 6780
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Db      6721 AAATCCTTAGAGAAGTTTGTTGGAGATGCAACTCGCCTAACAGATAAGCTTCTAGAATTG 6780

Qy      6781 TGCAATAAACCGGTTGATGGAAGTAGTTCCACATTAAGCATGAGCACTCATTTTAAAATG 6840
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      6781 TGCAATAAACCGGTTGATGGAAGTAGTTCCACATTAAGCATGAGCACTCATTTTAAAATG 6840

Qy      6841 CTTAAAAAGCTGGTAGAAGAAGCAACATTTAGTGAAATCCTCATTCCTCTACAATCAGTC 6900
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Db      6841 CTTAAAAAGCTGGTAGAAGAAGCAACATTTAGTGAAATCCTCATTCCTCTACAATCAGTC 6900

Qy      6901 ATGATACCTACACTTCCATCAATTCTGGGTACCCATGCTAACCATGCTAGCCATGAACCA 6960
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Db      6901 ATGATACCTACACTTCCATCAATTCTGGGTACCCATGCTAACCATGCTAGCCATGAACCA 6960

Qy      6961 TTTCCTGGACATTGGGCCTATATTGCAGGGTTTGATGATATGGTGGAAATTCTTGCTTCT 7020
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Db      6961 TTTCCTGGACATTGGGCCTATATTGCAGGGTTTGATGATATGGTGGAAATTCTTGCTTCT 7020

Qy      7021 CTTCAGAAACCAAAGAAGATTTCTTTAAAAGGCTCAGATGGAAAGTTCTACATCATGATG 7080
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Db      7021 CTTCAGAAACCAAAGAAGATTTCTTTAAAAGGCTCAGATGGAAAGTTCTACATCATGATG 7080

Qy      7081 TGTAAGCCAAAAGATGACCTGAGAAAGGATTGTAGACTAATGGAATTCAATTCCTTGATT 7140
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      7081 TGTAAGCCAAAAGATGACCTGAGAAAGGATTGTAGACTAATGGAATTCAATTCCTTGATT 7140

Qy      7141 AATAAGTGCTTAAGAAAAGATGCAGAGTCTCGTAGAAGAGAACTTCATATTCGAACATAT 7200
             ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      7141 AATAAGTGCTTAAGAAAAGATGCAGAGTCTCGTAGAAGAGAACTTCATATTCGAACATAT 7200

Qy      7201 GCAGTTATTCCACTAAATGATGAATGTGGGATTATTGAATGGGTGAACAACACTGCTGGT 7260
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Db      7201 GCAGTTATTCCACTAAATGATGAATGTGGGATTATTGAATGGGTGAACAACACTGCTGGT 7260

Qy      7261 TTGAGACCTATTCTGACCAAACTATATAAAGAAAAGGGAGTGTATATGACAGGAAAAGAA 7320
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Db      7261 TTGAGACCTATTCTGACCAAACTATATAAAGAAAAGGGAGTGTATATGACAGGAAAAGAA 7320

Qy      7321 CTTCGCCAGTGTATGCTACCAAAGTCAGCAGCTTTATCTGAAAAACTCAAAGTATTCCGA 7380
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Db      7321 CTTCGCCAGTGTATGCTACCAAAGTCAGCAGCTTTATCTGAAAAACTCAAAGTATTCCGA 7380

Qy      7381 GAATTTCTCCTGCCCAGGCATCCTCCTATTTTTCATGAGTGGTTTCTGAGAACATTCCCT 7440
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Db      7381 GAATTTCTCCTGCCCAGGCATCCTCCTATTTTTCATGAGTGGTTTCTGAGAACATTCCCT 7440

Qy      7441 GATCCTACATCATGGTACAGTAGTAGATCAGCTTACTGCCGTTCCACTGCAGTAATGTCA 7500
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Db      7441 GATCCTACATCATGGTACAGTAGTAGATCAGCTTACTGCCGTTCCACTGCAGTAATGTCA 7500

Qy      7501 ATGGTTGGTTATATTCTGGGGCTTGGAGACCGTCATGGTGAAAATATTCTCTTTGATTCT 7560
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Db      7501 ATGGTTGGTTATATTCTGGGGCTTGGAGACCGTCATGGTGAAAATATTCTCTTTGATTCT 7560

Qy      7561 TTGACTGGTGAATGCGTACATGTAGATTTCAATTGTCTTTTCAATAAGGGAGAAACCTTT 7620
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Db       7561 TTGACTGGTGAATGCGTACATGTAGATTTCAATTGTCTTTTCAATAAGGGAGAAACCTTT 7620

Qy       7621 GAAGTTCCAGAAATTGTGCCATTTCGCCTGACTCATAATATGGTTAATGGAATGGGTCCT 7680
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Db       7621 GAAGTTCCAGAAATTGTGCCATTTCGCCTGACTCATAATATGGTTAATGGAATGGGTCCT 7680

Qy       7681 ATGGGAACAGAGGGTCTTTTTCGAAGAGCATGTGAAGTTACAATGAGGCTGATGCGTGAT 7740
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Db       7681 ATGGGAACAGAGGGTCTTTTTCGAAGAGCATGTGAAGTTACAATGAGGCTGATGCGTGAT 7740

Qy       7741 CAGCGAGAGCCTTTAATGAGTGTCTTAAAGACTTTTCTACATGATCCTCTTGTGGAATGG 7800
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Db       7741 CAGCGAGAGCCTTTAATGAGTGTCTTAAAGACTTTTCTACATGATCCTCTTGTGGAATGG 7800

Qy       7801 AGTAAACCAGTGAAAGGGCATTCCAAAGCGCCACTGAATGAAACTGGAGAAGTTGTCAAT 7860
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Db       7801 AGTAAACCAGTGAAAGGGCATTCCAAAGCGCCACTGAATGAAACTGGAGAAGTTGTCAAT 7860

Qy       7861 GAAAAGGCCAAGACCCATGTTCTTGACATTGAGCAGCGACTACAAGGTGTAATCAAGACT 7920
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       7861 GAAAAGGCCAAGACCCATGTTCTTGACATTGAGCAGCGACTACAAGGTGTAATCAAGACT 7920

Qy       7921 CGAAATAGAGTGACAGGACTGCCGTTATCTATTGAAGGACATGTGCATTACCTTATACAA 7980
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       7921 CGAAATAGAGTGACAGGACTGCCGTTATCTATTGAAGGACATGTGCATTACCTTATACAA 7980

Qy       7981 GAAGCTACTGATGAAAACTTACTATGCCAGATGTATCTTGGTTGGACTCCATATATGTGA 8040
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Db       7981 GAAGCTACTGATGAAAACTTACTATGCCAGATGTATCTTGGTTGGACTCCATATATGTGA 8040

Qy       8041 AATGAAATTATGTAAAAGAATATGTTAATAATCTAAAAGTAATGCATTTGGTATGAATCT 8100
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Db       8041 AATGAAATTATGTAAAAGAATATGTTAATAATCTAAAAGTAATGCATTTGGTATGAATCT 8100

Qy       8101 GTGGTTGTATCTGTTCAATTCTAAAGTACAACATAAATTTACGTTCTCAGCAACTGTTAT 8160
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Db       8101 GTGGTTGTATCTGTTCAATTCTAAAGTACAACATAAATTTACGTTCTCAGCAACTGTTAT 8160

Qy       8161 TTCTCTCTGATCATTAATTATATGTAAAATAATATACATTCAGTTATTAAGAAATAAACT 8220
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       8161 TTCTCTCTGATCATTAATTATATGTAAAATAATATACATTCAGTTATTAAGAAATAAACT 8220

Qy       8221 GCTTTCTTAATAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA 8265
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Db       8221 GCTTTCTTAATAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA 8265
<!--EndFragment-->
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Exhibit D

<!--StartFragment-->RESULT 1
US-10-388-360-295
; Sequence 295, Application US/10388360
; Patent No. 7081340
; GENERAL INFORMATION:
; APPLICANT: GENOMIC HEALTH
; APPLICANT: Baker, Joffre B.
; APPLICANT: Cronin, Maureen T.
; APPLICANT: Kiefer, Michael C.
; APPLICANT: Shak, Steve
; APPLICANT: Walker, Michael Graham
; TITLE OF INVENTION: GENE EXPRESSION PROFILING IN BIOPSIED TUMOR TISSUES
; FILE REFERENCE: 39740-0001US
; CURRENT APPLICATION NUMBER: US/10/388,360
; CURRENT FILING DATE: 2003-03-12
; PRIOR APPLICATION NUMBER: US 60/412,049
; PRIOR FILING DATE: 2002-09-18
; PRIOR APPLICATION NUMBER: US 60/364,890
; PRIOR FILING DATE: 2002-03-13
; NUMBER OF SEQ ID NOS: 384
; SOFTWARE: FastSEQ for Windows Version 4.0
; SEQ ID NO 295
; LENGTH: 2042
; TYPE: DNA
; ORGANISM: Homo sapiens
US-10-388-360-295

Query Match 100.0%; Score 2042; DB 5; Length 2042;
Best Local Similarity 100.0%; Pred. No. 0;
Matches 2042; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

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Qy          1 GGGGCCAGTCGTTCGCCGGAAAGCATTTGTCTCCCACCTCATCATAACAACAATTAATTT 60
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db          1 GGGGCCAGTCGTTCGCCGGAAAGCATTTGTCTCCCACCTCATCATAACAACAATTAATTT 60

Qy         61 CCTCTGGGGCCTGAGGAGGGCAGAATTTCAACCTTCGGTGTGCTTGGGAGTGGCGATTGT 120
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db         61 CCTCTGGGGCCTGAGGAGGGCAGAATTTCAACCTTCGGTGTGCTTGGGAGTGGCGATTGT 120

Qy        121 GATTTACACGACAAAATGCCGAGGTGCTCGGTGGAGTCATGGCAGTGCCCTTTGTGGAAG 180
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        121 GATTTACACGACAAAATGCCGAGGTGCTCGGTGGAGTCATGGCAGTGCCCTTTGTGGAAG 180

Qy        181 ACTGGGACTTGGTGCAAACCCTGGGAGAAGGTGCCTATGGAGAAGTTCAACTTGCTGTGA 240
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        181 ACTGGGACTTGGTGCAAACCCTGGGAGAAGGTGCCTATGGAGAAGTTCAACTTGCTGTGA 240

Qy        241 ATAGAGTAACTGAAGAAGCAGTCGCAGTGAAGATTGTAGATATGAAGCGTGCCGTAGACT 300
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Db        241 ATAGAGTAACTGAAGAAGCAGTCGCAGTGAAGATTGTAGATATGAAGCGTGCCGTAGACT 300

Qy        301 GTCCAGAAAATATTAAGAAAGAGATCTGTATCAATAAAATGCTAAATCATGAAAATGTAG 360
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Db        301 GTCCAGAAAATATTAAGAAAGAGATCTGTATCAATAAAATGCTAAATCATGAAAATGTAG 360

Qy        361 TAAAATTCTATGGTCACAGGAGAGAAGGCAATATCCAATATTTATTTCTGGAGTACTGTA 420
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Db        361 TAAAATTCTATGGTCACAGGAGAGAAGGCAATATCCAATATTTATTTCTGGAGTACTGTA 420

Qy        421 GTGGAGGAGAGCTTTTTGACAGAATAGAGCCAGACATAGGCATGCCTGAACCAGATGCTC 480
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Db        421 GTGGAGGAGAGCTTTTTGACAGAATAGAGCCAGACATAGGCATGCCTGAACCAGATGCTC 480

Qy        481 AGAGATTCTTCCATCAACTCATGGCAGGGGTGGTTTATCTGCATGGTATTGGAATAACTC 540
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Db        481 AGAGATTCTTCCATCAACTCATGGCAGGGGTGGTTTATCTGCATGGTATTGGAATAACTC 540

Qy        541 ACAGGGATATTAAACCAGAAAATCTTCTGTTGGATGAAAGGGATAACCTCAAAATCTCAG 600
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Db        541 ACAGGGATATTAAACCAGAAAATCTTCTGTTGGATGAAAGGGATAACCTCAAAATCTCAG 600

Qy        601 ACTTTGGCTTGGCAACAGTATTTCGGTATAATAATCGTGAGCGTTTGTTGAACAAGATGT 660
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Db        601 ACTTTGGCTTGGCAACAGTATTTCGGTATAATAATCGTGAGCGTTTGTTGAACAAGATGT 660

Qy        661 GTGGTACTTTACCATATGTTGCTCCAGAACTTCTGAAGAGAAGAGAATTTCATGCAGAAC 720
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Db        661 GTGGTACTTTACCATATGTTGCTCCAGAACTTCTGAAGAGAAGAGAATTTCATGCAGAAC 720

Qy        721 CAGTTGATGTTTGGTCCTGTGGAATAGTACTTACTGCAATGCTCGCTGGAGAATTGCCAT 780
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        721 CAGTTGATGTTTGGTCCTGTGGAATAGTACTTACTGCAATGCTCGCTGGAGAATTGCCAT 780

Qy        781 GGGACCAACCCAGTGACAGCTGTCAGGAGTATTCTGACTGGAAAGAAAAAAAAACATACC 840
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        781 GGGACCAACCCAGTGACAGCTGTCAGGAGTATTCTGACTGGAAAGAAAAAAAAACATACC 840

Qy        841 TCAACCCTTGGAAAAAAATCGATTCTGCTCCTCTAGCTCTGCTGCATAAAATCTTAGTTG 900
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        841 TCAACCCTTGGAAAAAAATCGATTCTGCTCCTCTAGCTCTGCTGCATAAAATCTTAGTTG 900

Qy        901 AGAATCCATCAGCAAGAATTACCATTCCAGACATCAAAAAAGATAGATGGTACAACAAAC 960
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Db        901 AGAATCCATCAGCAAGAATTACCATTCCAGACATCAAAAAAGATAGATGGTACAACAAAC 960

Qy        961 CCCTCAAGAAAGGGGCAAAAAGGCCCCGAGTCACTTCAGGTGGTGTGTCAGAGTCTCCCA 1020
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Db        961 CCCTCAAGAAAGGGGCAAAAAGGCCCCGAGTCACTTCAGGTGGTGTGTCAGAGTCTCCCA 1020

Qy       1021 GTGGATTTTCTAAGCACATTCAATCCAATTTGGACTTCTCTCCAGTAAACAGTGCTTCTA 1080
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Db       1021 GTGGATTTTCTAAGCACATTCAATCCAATTTGGACTTCTCTCCAGTAAACAGTGCTTCTA 1080

Qy       1081 GTGAAGAAAATGTGAAGTACTCCAGTTCTCAGCCAGAACCCCGCACAGGTCTTTCCTTAT 1140
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Db       1081 GTGAAGAAAATGTGAAGTACTCCAGTTCTCAGCCAGAACCCCGCACAGGTCTTTCCTTAT 1140

Qy       1141 GGGATACCAGCCCCTCATACATTGATAAATTGGTACAAGGGATCAGCTTTTCCCAGCCCA 1200
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Db       1141 GGGATACCAGCCCCTCATACATTGATAAATTGGTACAAGGGATCAGCTTTTCCCAGCCCA 1200

Qy       1201 CATGTCCTGATCATATGCTTTTGAATAGTCAGTTACTTGGCACCCCAGGATCCTCACAGA 1260
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Db       1201 CATGTCCTGATCATATGCTTTTGAATAGTCAGTTACTTGGCACCCCAGGATCCTCACAGA 1260

Qy       1261 ACCCCTGGCAGCGGTTGGTCAAAAGAATGACACGATTCTTTACCAAATTGGATGCAGACA 1320
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Db       1261 ACCCCTGGCAGCGGTTGGTCAAAAGAATGACACGATTCTTTACCAAATTGGATGCAGACA 1320

Qy       1321 AATCTTATCAATGCCTGAAAGAGACTTGTGAGAAGTTGGGCTATCAATGGAAGAAAAGTT 1380
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Db       1321 AATCTTATCAATGCCTGAAAGAGACTTGTGAGAAGTTGGGCTATCAATGGAAGAAAAGTT 1380

Qy       1381 GTATGAATCAGGTTACTATATCAACAACTGATAGGAGAAACAATAAACTCATTTTCAAAG 1440
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Db       1381 GTATGAATCAGGTTACTATATCAACAACTGATAGGAGAAACAATAAACTCATTTTCAAAG 1440

Qy       1441 TGAATTTGTTAGAAATGGATGATAAAATATTGGTTGACTTCCGGCTTTCTAAGGGTGATG 1500
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Qy       1501 GATTGGAGTTCAAGAGACACTTCCTGAAGATTAAAGGGAAGCTGATTGATATTGTGAGCA 1560
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       1501 GATTGGAGTTCAAGAGACACTTCCTGAAGATTAAAGGGAAGCTGATTGATATTGTGAGCA 1560

Qy       1561 GCCAGAAGGTTTGGCTTCCTGCCACATGATCGGACCATCGGCTCTGGGGAATCCTGGTGA 1620
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Db       1561 GCCAGAAGGTTTGGCTTCCTGCCACATGATCGGACCATCGGCTCTGGGGAATCCTGGTGA 1620

Qy       1621 ATATAGTGCTGCTATGTTGACATTATTCTTCCTAGAGAAGATTATCCTGTCCTGCAAACT 1680
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Db       1621 ATATAGTGCTGCTATGTTGACATTATTCTTCCTAGAGAAGATTATCCTGTCCTGCAAACT 1680

Qy       1681 GCAAATAGTAGTTCCTGAAGTGTTCACTTCCCTGTTTATCCAAACATCTTCCAATTTATT 1740
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Db       1681 GCAAATAGTAGTTCCTGAAGTGTTCACTTCCCTGTTTATCCAAACATCTTCCAATTTATT 1740

Qy       1741 TTGTTTGTTCGGCATACAAATAATACCTATATCTTAATTGTAAGCAAAACTTTGGGGAAA 1800
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Db       1741 TTGTTTGTTCGGCATACAAATAATACCTATATCTTAATTGTAAGCAAAACTTTGGGGAAA 1800

Qy       1801 GGATGAATAGAATTCATTTGATTATTTCTTCATGTGTGTTTAGTATCTGAATTTGAAACT 1860
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                ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       1801 GGATGAATAGAATTCATTTGATTATTTCTTCATGTGTGTTTAGTATCTGAATTTGAAACT 1860

Qy       1861 CATCTGGTGGAAACCAAGTTTCAGGGGACATGAGTTTTCCAGCTTTTATACACACGTATC 1920
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Db       1861 CATCTGGTGGAAACCAAGTTTCAGGGGACATGAGTTTTCCAGCTTTTATACACACGTATC 1920

Qy       1921 TCATTTTTATCAAAACATTTTGTTTAATTCAAAAAGTACATATTTCTTCCATGTTGATTT 1980
                ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       1921 TCATTTTTATCAAAACATTTTGTTTAATTCAAAAAGTACATATTTCTTCCATGTTGATTT 1980

Qy       1981 AATTCTAAGATGAACCAATAAAGACATAATTCTTGCAAAAAAAAAAAAAAAAAAAAAAAAA 2040
                ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       1981 AATTCTAAGATGAACCAATAAAGACATAATTCTTGCAAAAAAAAAAAAAAAAAAAAAAAAA 2040

Qy       2041 AA 2042
                ||
Db       2041 AA 2042

<!--EndFragment-->
```